

# epiREPORT

## Manitoba Annual Summary of Communicable Diseases

### 2013

January 1, 2013 to December 31, 2013

*with 5-year average comparison (January 1, 2008 to December 31, 2012)*

Epidemiology & Surveillance  
Public Health Branch  
Public Health and Primary Health Care Division  
Manitoba Health, Healthy Living and Seniors

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### Abbreviations and Acronyms

C.	Clostridium
CDSD	Communicable Diseases Surveillance Database
IMD	Invasive Meningococcal Disease
IPD	Invasive Pneumococcal Disease
MHHLS	Manitoba Health, Healthy Living and Seniors
MRSA	Methicillin-Resistant <i>Staphylococcus aureus</i>
RHA	Regional Health Authority
Staph.	<i>Staphylococcus</i>
Strep.	Streptococcal
STBBI	Sexually Transmitted and Blood-Borne Infections
STSS	Streptococcal Toxic Shock Syndrome
VRE	Vancomycin Resistant Enterococci
VTEC	Verotoxigenic <i>Escherichia coli</i>

### Regional Health Authorities

WRHA	Winnipeg Regional Health Authority (includes Churchill)
Southern Health – Santé Sud	Southern Health – Santé Sud
Interlake-Eastern	Interlake-Eastern Regional Health Authority
Prairie Mountain	Prairie Mountain Health
Northern	Northern Regional Health Authority

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## Highlights

### Nosocomial and Antibiotic Resistant Organisms

- In 2013, methicillin-resistant *Staphylococcus aureus* (MRSA) had the highest incidence (341.7 cases per 100,000 population) of all diseases included in this report, accounting for 55.5% of the total cases (4405 cases of MRSA out of 7944 total cases). Incidence rates for MRSA in Northern Regional Health Authority (RHA) were 11 to 29 times greater than the incidence rates in the other four regions.
- Of the diseases included in this report, vancomycin resistant *enterococci* (VRE) had the second highest incidence rate in 2013 (107.7 cases per 100,000 population), and accounted for 17.5% of the total cases (1389 cases of VRE out of 7944 total cases) VRE incidence rates remained high following a nation-wide increase beginning in 2010.

### Enteric Diseases

- In 2008, Northern RHA experienced an outbreak of cryptosporidiosis. The spike in incidence associated with this outbreak likely contributed to Northern RHA's high 5-year average incidence (9.4 cases per 100,000 population compared to the 2013 incidence of 1.3 cases per 100,000 population).
- Northern RHA experienced very unstable shigellosis incidence rates from 2008 to 2013 (fluctuating between high rates and low rates) but consistently had the highest rate among all the RHAs, over all six years (8.0 cases per 100,000 population in 2013 versus 26.2 cases per 100,000 population in the 5-year average).

### Vaccine Preventable Diseases

- In 2013, the largest incidence of invasive pneumococcal disease (IPD) occurred in infants (<1 year) (42.5 cases per 100,000 infant population). Northern RHA experienced the highest incidence rates among all RHAs from 2008 to 2013. Note: Northern RHA's incidence rates declined by about 30 cases per 100,000 population over the six years, while the other four RHA's incidence rates remained fairly unchanged.

### Zoonotic and Environmental Diseases

- Southern Health-Santé Sud carried the largest burden of Lyme disease (6.9 cases per 100,000 population in 2013); its incidence rates increased by about 6 cases per 100,000 population between 2008 and 2013 while the other RHA's incidence rates remained constant. Northern RHA had no confirmed cases of Lyme disease within the 6 years from 2008 to 2013.

### Other Diseases

- Infants (<1 year) and adults over the age of 60 had the highest incidence of invasive beta-hemolytic streptococcal disease in 2013. Infants experienced 97.2 cases per 100,000 population; adults over 60 experienced 43.7 cases per 100,000 population. Northern RHA had the highest rates of invasive beta-hemolytic streptococcal disease of all the RHAs, from 2008 to 2013.

## Report Overview

### Introduction

This report, *Manitoba Annual Summary of Communicable Diseases (2013)*, is the first, publicly released, annual summary of laboratory-confirmed, communicable diseases in Manitoba. It focuses specifically on infectious diseases listed as “reportable” under *The Public Health Act* with the exception of Influenza, tuberculosis, and the sexually transmitted and blood-borne infections – these diseases appear in other annual reports produced by Manitoba Health, Healthy Living and Seniors (MH HLS) (for a list of all reportable diseases see Appendix A). The objectives of this report are to a) provide an overview of confirmed, communicable diseases in Manitoba for the year 2013, and b) serve as a baseline for future reports.

### Methods

Of the reportable disease cases that occurred in Manitoba between January 1<sup>st</sup>, 2008 and December 31<sup>st</sup>, 2013, only laboratory-confirmed cases that were reported to MH HLS were included in this report. Throughout the report, the 2013 data were compared to the data of the previous 5 years (in the form of the 5-year average [2008-2012] or by year from 2008 to 2013), when the comparison was deemed valuable.

Incidence rates were calculated using the mid-year population count for that year. For all tables and graphs the incidence rates were provided as “cases per 100,000 population” – that is, the number of cases per 100,000 individuals in the population. Regional comparisons were created based on the case’s region of residence, not on the region in which the case was tested and/or diagnosed. Thus, data for those individuals who were tested in Manitoba, but lived outside of the province, were not included in this report.

#### Notes:

- Any disease with less than or equal to five cases in 2013 did not have a detailed analysis performed. Information for these diseases was only included in the comparison tables both at the beginning of the report, and in the disease category to which the disease belongs, denoted by an asterisk (\*).
- For the purpose of this report, a “disease of rare occurrence” was defined as any disease with less than or equal to 15 cases in 2013, and denoted by a superscript R (R) in the comparison tables. For diseases of rare occurrence graphical analysis was not meaningful and was not included.

The surveillance data used in this report were extracted on July 30<sup>th</sup>, 2014 from the Communicable Diseases Surveillance Database (CDSD) housed by MH HLS.

In many areas of this report, rates are calculated for cell counts less than and equal to 5. It is important to remember that these rates are not statistically robust and should not be used for policy planning or other decision making purposes.

## About Surveillance Data

Surveillance data in Manitoba are routinely collected under *The Public Health Act* and are subject to certain limitations. Often, the number of reported cases of any disease is a fraction of the actual count. Individuals may not seek medical care for “mild” symptoms; if they do, the doctor may not order a lab test to confirm the disease. In addition, surveillance data results can be skewed as doctors may be more likely to order tests for severe diseases or those diseases which pose a danger to public health. The amount of testing and reporting performed can be influenced in the event of an outbreak, or by political and media pressures. Increased reporting can make it appear as though there has been an increase in the number of cases in a community, while the actual number of cases remains constant.

Surveillance data are also influenced by changes in testing practices (e.g., universal screening for an organism upon admission to health facilities), laboratory capacity (e.g., only testing a certain proportion of influenza cases during a known outbreak) and changes in lab technology (e.g., more sensitive diagnosis). All of these factors must be considered when drawing conclusions about surveillance data.

**It is especially important to consider these limitations when comparing RHA incidence rates and case counts. It is not uncommon for there to be variation in the number of cases tested and sent for laboratory confirmation between the RHAs.**

## Comparison of All Laboratory-confirmed, Reportable Diseases

Table 1: Laboratory-confirmed, reportable disease cases in Manitoba per 100,000 population, 2013 and 5-year Average (2008-2012)

Disease Name	2013		Total Cases	2008-2012			
	Total			Number of Cases	5-year Average		
	Number of Cases	Incidence <sup>A</sup> (95% Confidence Interval)			Incidence <sup>A</sup> (95% Confidence Interval)		
<b>Nosocomial and Antibiotic Resistant Organisms</b>							
<i>Clostridium difficile</i> Infection	856	66.4 (62.0, 71.0)	4263	853	69.1 (64.6, 74.0)		
Methicillin-Resistant <i>Staphylococcus aureus</i> (MRSA)	4405	341.7 (331.7, 351.9)	15,943	3189	258.6 (249.7, 267.7)		
Vancomycin Resistant <i>Enterococci</i> (VRE)	1389	107.7 (102.2, 113.6)	3218	644	52.2 (48.3, 56.4)		
<b>Enteric Diseases</b>							
Amebiasis	17	1.3 (0.8, 2.1)	183	37	3.0 (2.1, 4.1)		
<i>Bacillus cereus</i> food poisoning*	1	0.1 (0.0, 0.4)	6	2	0.1 (0.0, 0.5)		
<i>Clostridium perfringens</i> <sup>R</sup>	7	0.5 (0.2, 1.1)	11	3	0.2 (0.0, 0.6)		
Campylobacteriosis	210	16.3 (14.2, 18.7)	1241	249	20.1 (17.7, 22.8)		
Cholera*	0	0.0 (0.0, 0.3)	1	<1	0.0 (0.0, 0.3)		
Cryptosporidiosis	40	3.1 (2.2, 4.2)	194	39	3.1 (2.3, 4.3)		
Cyclosporiasis*	2	0.2 (0.0, 0.6)	5	1	0.1 (0.0, 0.5)		
Giardiasis	90	7.0 (5.6, 8.6)	611	123	9.9 (8.2, 11.8)		
Hepatitis A <sup>R</sup>	11	0.9 (0.4, 1.5)	40	8	0.6 (0.3, 1.3)		
Listeriosis*	2	0.2 (0.0, 0.6)	20	4	0.3 (0.1, 0.8)		
Paratyphoid <sup>R</sup>	7	0.5 (0.2, 1.1)	22	5	0.4 (0.1, 0.8)		
Salmonellosis	227	17.6 (15.4, 20.1)	1072	215	17.4 (15.1, 19.8)		
Shigellosis	23	1.8 (1.1, 2.7)	210	42	3.4 (2.5, 4.6)		
<i>Vibrio Parahaemolyticus</i> *	2	0.2 (0.0, 0.6)	5	1	0.1 (0.0, 0.5)		
Verotoxigenic <i>Escherichia coli</i> (VTEC)	29	2.2 (1.5, 3.2)	250	50	4.1 (3.0, 5.4)		
Yersiniosis*	5	0.4 (0.1, 0.9)	51	11	0.8 (0.4, 1.5)		
<b>Vaccine Preventable Diseases</b>							
Diphtheria*	0	0.0 (0.0, 0.3)	4	1	0.1 (0.0, 0.5)		
<i>Haemophilus influenzae</i> <sup>R</sup>	14	1.1 (0.6, 1.8)	65	13	1.1 (0.6, 1.8)		
Invasive Meningococcal Disease (IMD) <sup>R</sup>	9	0.7 (0.3, 1.3)	25	5	0.4 (0.1, 0.9)		
Invasive Pneumococcal Disease (D)	132	10.2 (8.6, 12.1)	719	144	11.7 (9.9, 13.8)		
Measles*	0	0.0 (0.0, 0.3)	1	<1	0.0 (0.0, 0.3)		
Mumps*	1	0.1 (0.0, 0.4)	21	5	0.3 (0.1, 0.8)		
Pertussis <sup>R</sup>	7	0.5 (0.2, 1.1)	245	49	4.0 (2.9, 5.3)		
Rubella, Congenital*	0	0.0 (0.0, 0.3)	1	<1	0.0 (0.0, 0.3)		
Rubella, Confirmed*	0	0.0 (0.0, 0.3)	5	1	0.1 (0.0, 0.5)		
Typhoid*	2	0.2 (0.0, 0.6)	30	6	0.5 (0.2, 1.1)		
<b>Zoonotic and Environmental Diseases</b>							
Blastomycosis	19	1.5 (0.9, 2.3)	55	11	0.9 (0.4, 1.6)		
Brucellosis*	2	0.2 (0.0, 0.6)	6	2	0.1 (0.0, 0.5)		

Dengue <sup>R</sup>	12	0.9 (0.5, 1.6)	8	2	0.1 (0.0, 0.6)
<i>Diphyllobothrium latum</i> <sup>R</sup>	13	1.0 (0.5, 1.7)	36	8	0.6 (0.2, 1.2)
Hantavirus*	0	0.0 (0.0, 0.3)	1	<1	0.0 (0.0, 0.3)
Legionellosis*	4	0.3 (0.1, 0.8)	14	3	0.2 (0.1, 0.7)
Lyme	17	1.3 (0.8, 2.1)	27	6	0.4 (0.1, 0.9)
Malaria <sup>R</sup>	15	1.2 (0.7, 1.9)	84	17	1.4 (0.8, 2.2)
Q. Fever*	2	0.2 (0.0, 0.6)	4	1	0.1 (0.0, 0.5)
Rickettsial Disease, Other*	0	0.0 (0.0, 0.3)	2	<1	0.0 (0.0, 0.3)
Strongyloidiasis	25	1.9 (1.3, 2.9)	95	19	1.5 (0.9, 2.4)
Toxoplasmosis*	0	0.0 (0.0, 0.3)	13	3	0.2 (0.1, 0.7)
Trichinosis*	0	0.0 (0.0, 0.3)	4	1	0.1 (0.0, 0.5)
Trypanosomiasis*	3	0.2 (0.0, 0.7)	14	3	0.2 (0.1, 0.7)
Tularemia*	4	0.3 (0.1, 0.8)	4	1	0.1 (0.0, 0.5)
<b>Other Diseases</b>					
Creutzfeldt-Jakob Disease (CJD)*	1	0.1 (0.0, 0.4)	4	1	0.3 (0.0, 0.5)
Invasive Beta-hemolytic Streptococcal Disease	313	24.3 (21.7, 27.1)	1235	247	20.0 (17.6, 22.7)
Necrotizing Fasciitis	19	1.5 (0.9, 2.3)	37	7	0.6 (0.2, 1.2)
<i>Staphylococcus aureus</i> (Toxic Shock)*	0	0.0 (0.0, 0.3)	2	<1	0.0 (0.0, 0.3)
Streptococcal Glomerulonephritis*	0	0.0 (0.0, 0.3)	1	<1	0.0 (0.0, 0.3)
Streptococcal Toxic Shock Syndrome (STSS)*	4	0.3 (0.1, 0.8)	4	1	0.1 (0.0, 0.5)
Viral Hepatitis, Other*	3	0.2 (0.0, 0.7)	8	2	0.1 (0.0, 0.6)

\* Cases per 100,000 population

\* Disease with a cell count  $\leq 5$  in 2013; will not have a detailed analyses performed (see Methods, page 4)

<sup>R</sup> Disease of rare occurrence (see Methods, page 4)

Note: Confidence intervals in *italics* are one-sided, 97.5% confidence intervals

## Nosocomial and Antibiotic Resistant Organisms

Nosocomial infections, or "hospital-acquired infections", are infections acquired during hospital care, which are not present, or incubating, at admission. Antibiotic resistant organisms (AROs) are organisms that have developed resistance to one or more antibiotics. From 2008 to 2013, there were three organisms in this category under surveillance in Manitoba: *Clostridium difficile* infection, methicillin-resistant *Staphylococcus aureus* (MRSA), and vancomycin resistant *enterococci* (VRE). Nosocomial and AROs accounted for 83.7% of all reportable disease cases in this report (Appendix B).

Note that MHHLS's surveillance data cannot differentiate between MRSA infections and MRSA colonisations and there is no distinction made between community and hospital-acquired strains. VRE data are also undifferentiated by infection versus colonization.

Table 2: Nosocomial and Antibiotic Resistant Organisms in Manitoba, 2008-2013

Disease Name	2008		2009		2010		2011		2012		2013	
	Number of Cases	Incidence^										
<i>Clostridium difficile</i> Infection	888	74.1	840	69.2	822	66.8	906	72.5	807	63.5	856	66.4
Methicillin-Resistant <i>Staphylococcus aureus</i> (MRSA)	2493	207.9	2802	230.7	3422	278.2	3313	264.9	3913	307.8	4405	341.7
Vancomycin Resistant <i>Enterococci</i> (VRE)	94	7.8	94	7.7	342	27.8	1245	99.6	1443	113.5	1389	107.7

<sup>^</sup> Cases per 100,000 population

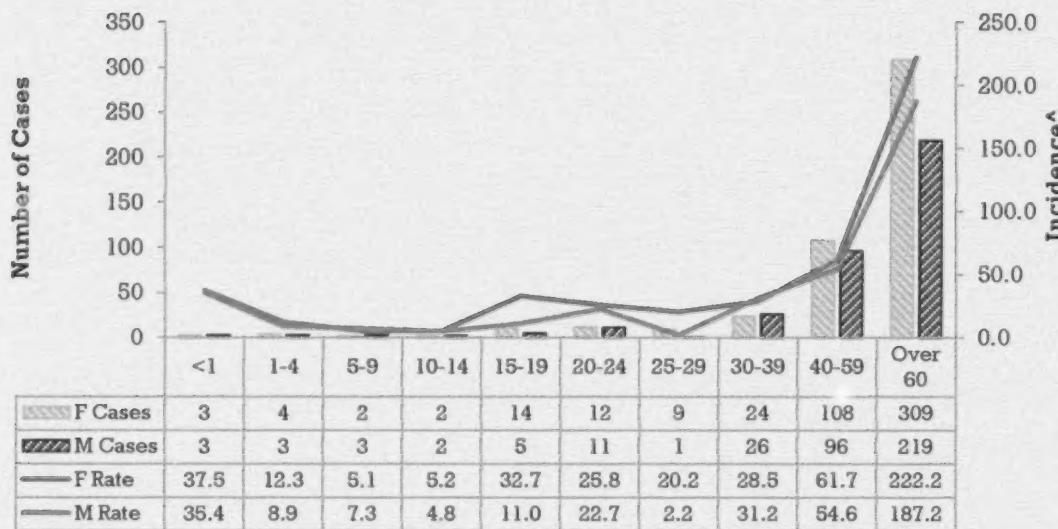
## Clostridium difficile Infection

*Clostridium difficile* infection was predominantly seen in older adults. Table 3 shows the average age of infection in 2013 was 63.1 years (very close to the average age of infection for the previous 5 years, 65.8 years). This is reflected in Figure 1, where about 6 out of 10 cases, for both males and females (59.3% and 63.4%, respectively), occurred in the “over 60” age group. Of the diseases included in this report, *C. difficile* infection had the third highest incidence rate in 2013, and accounted for 10.8% of the total cases (Appendix B).

Table 3: *Clostridium difficile* Infection in Manitoba, 2013 and 5-year Average (2008-2012)

	2013	2008-2012
	Total	5-year Average
<b>Number of Cases</b>		
Overall	856	853
Male	369	365
Female	487	488
<b>Incidence^</b>		
Overall	66.4	69.1
Male	57.7	59.9
Female	74.9	78.2
<b>Age at Onset (years)</b>		
Average	63.1	65.8
Median	65.5	70.3
Min. /Max.	(0.0, 100.1)	(0.0, 103.0)

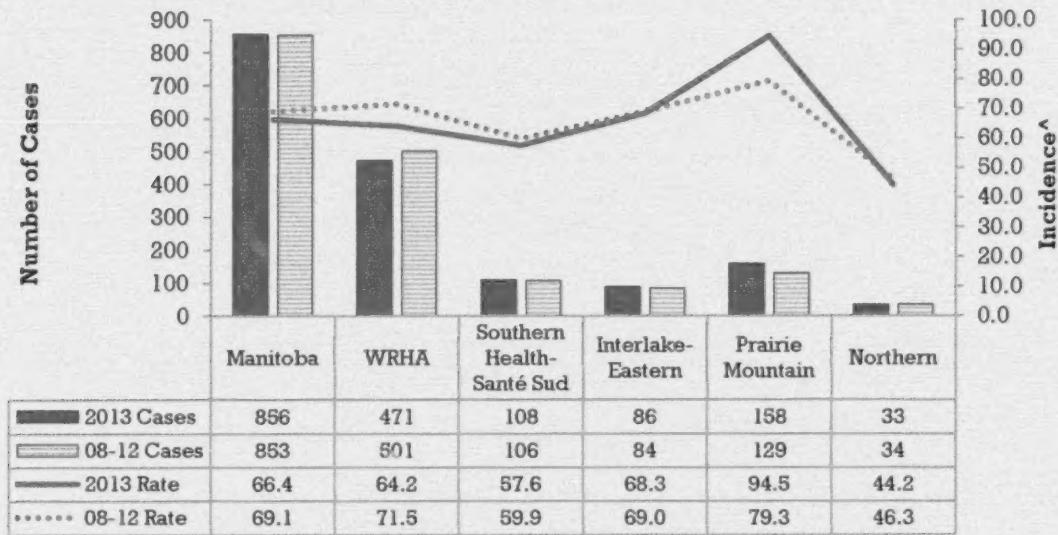
<sup>^</sup> Cases per 100,000 population



<sup>^</sup> Cases per 100,000 population

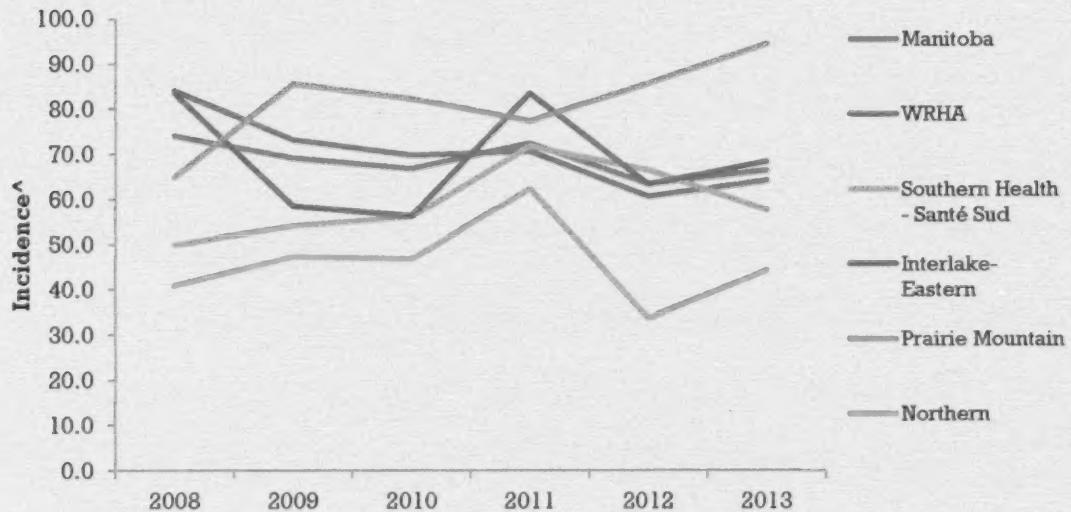
Figure 1: *Clostridium difficile* Infection by Age Group and Sex in Manitoba, 2013, (n=856)

In 2013, Prairie Mountain Health had the highest incidence of *C. difficile* infection with 94.5 cases per 100,000 population (Figure 2). The lowest incidence was in Northern RHA with 44.2 cases per 100,000 population. Figure 3 shows Northern RHA consistently had the lowest rate of *C. difficile* infection across all six years, while Prairie Mountain Health had the highest rate of *C. difficile* infection in four out of the six years.



<sup>^</sup> Cases per 100,000 population

Figure 2: *Clostridium difficile* Infection by Regional Health Authority in Manitoba, 2013 and 5-year Average (2008-2012)



<sup>^</sup> Cases per 100,000 population

Figure 3: *Clostridium difficile* Infection by Regional Health Authority in Manitoba, 2008-2013

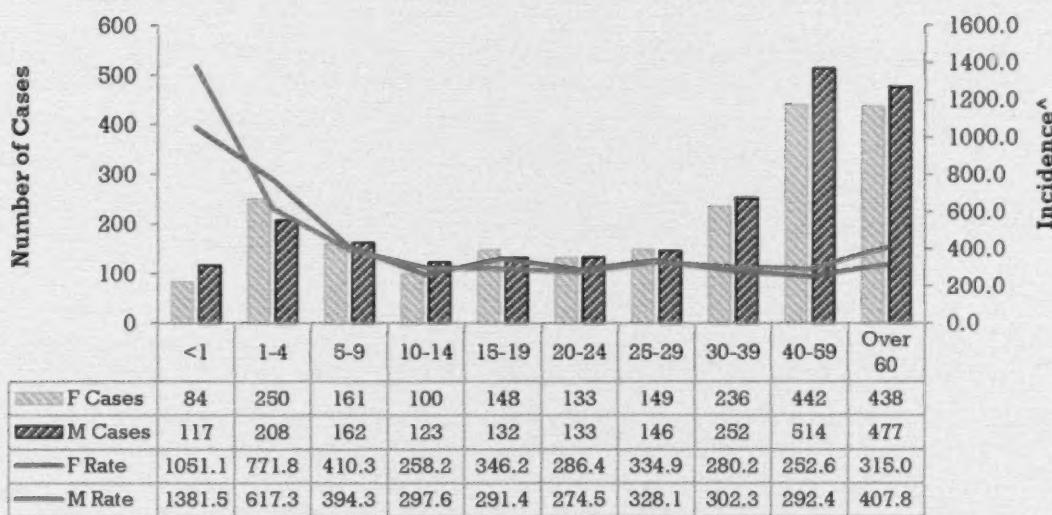
## Methicillin-Resistant *Staphylococcus aureus* (MRSA)

In 2013, MRSA had the highest incidence (341.7 cases per 100,000 population) of all diseases included in this report, accounting for 55.5% of the total cases (4405 cases of MRSA out of 7944 total cases) (Appendix B). The 2013 incidence rate was almost 100 cases per 100,000 population greater than the 5-year average incidence rate (Table 4). Figure 4 shows the highest incidence of MRSA occurred in infants (<1 year). 1221.1 cases per 100,000 infant population were confirmed, compared to the lowest rates of 252.6 cases per 100,000 females in the age 40-59 years group and 274.5 cases per 100,000 males in the 20-24 age group.

Table 4: MRSA in Manitoba, 2013 and 5-year Average (2008-2012)

	2013	2008-2012
	Total	5-year Average
<b>Number of Cases</b>		
Overall	4405	3189
Male	2264	1616
Female	2141	1573
<b>Incidence^</b>		
Overall	341.7	258.6
Male	354.3	265.4
Female	329.2	252.0
<b>Age at Onset (years)</b>		
Average	36.2	36.9
Median	32.8	32.8
Min./Max.	(<1, 101.4)	(<1, 105.3)

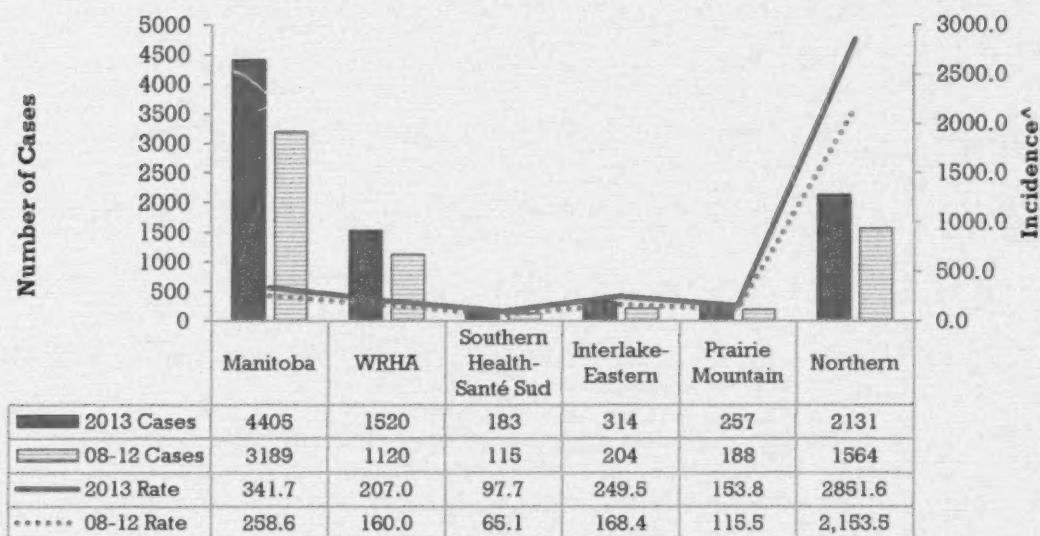
<sup>^</sup> Cases per 100,000 population



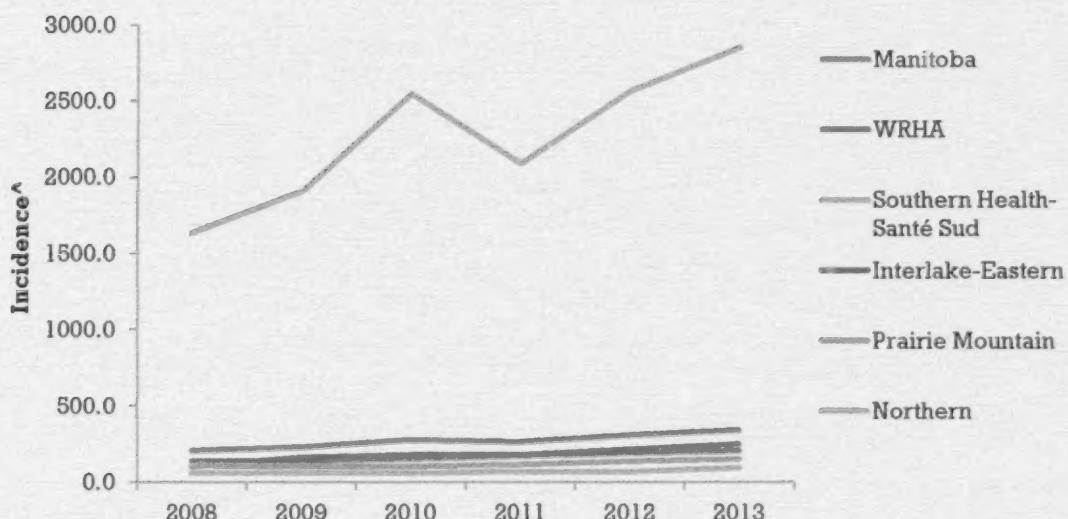
<sup>^</sup> Cases per 100,000 population

Figure 4: MRSA by Age Group and Sex in Manitoba, 2013, (n=4392)

In 2013, the incidence rate of MRSA in Northern RHA was 11 to 29 times greater than the incidence rates in the other four regions (Figure 5). These differences were even greater when comparing the 5-year averages. Figure 6 provides a clear visual of how high the incidence of MRSA was in Northern RHA, compared to the other regions.



<sup>^</sup> Cases per 100,000 population  
Figure 5: MRSA by Regional Health Authority in Manitoba, 2013 and 5-year Average (2008-2012)



<sup>^</sup> Cases per 100,000 population  
Figure 6: MRSA by Regional Health Authority in Manitoba, 2008-2013

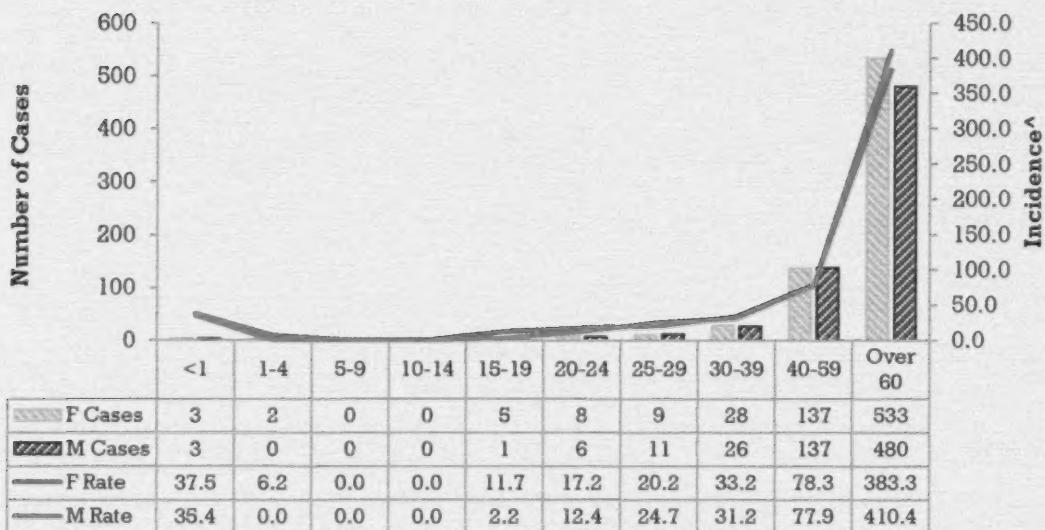
## Vancomycin Resistant Enterococci (VRE)

VRE predominantly affected the older age groups in 2013. Figure 7 shows the incidence rates for those over 60 were about 5 times greater than for those with even the second highest rates (40-59 year olds). This coincides with the average age of disease onset in 2013, 69.2 years (Table 5). The incidence of VRE in 2013 was over double that of the incidence of VRE in the 5-year average (107.7 cases per 100,000 population compared to 52.2 cases per 100,000 population). Of the diseases included in this report, VRE had the second highest incidence rate in 2013, and accounted for 17.5% of the total cases (1389 case of VRE out of 7944 total cases) (Appendix B).

Table 5: VRE in Manitoba, 2013 and 5-year Average (2008-2012)

	2013	2008-2012
	Total	5-year Average
<b>Number of Cases</b>		
Overall	1389	644
Male	664	318
Female	725	326
<b>Incidence^</b>		
Overall	107.7	52.2
Male	103.9	52.2
Female	111.5	52.2
<b>Age at Onset (years)</b>		
Average	69.2	68.8
Median	71.6	71.3
Min./Max.	(0.0, 101.7)	(<1, 101.6)

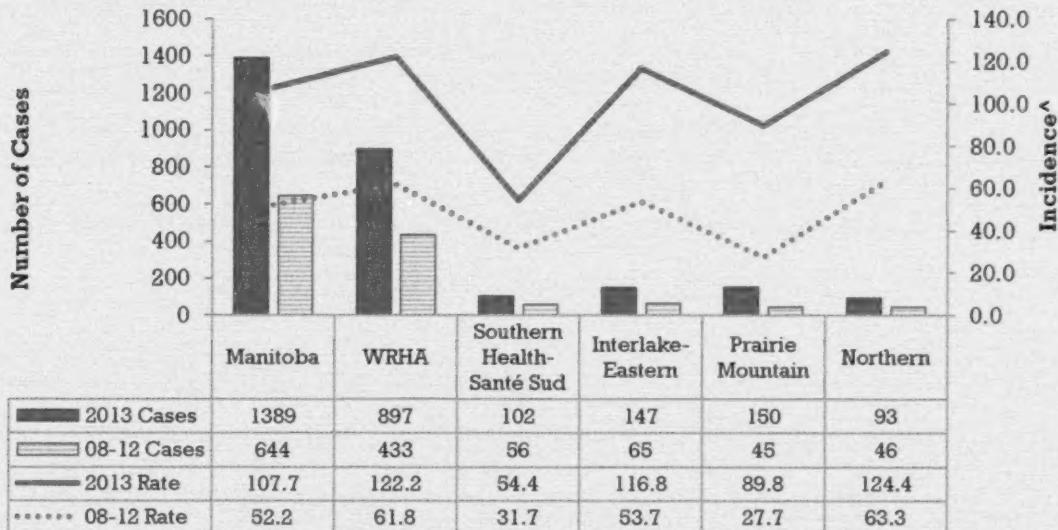
<sup>^</sup> Cases per 100,000 population



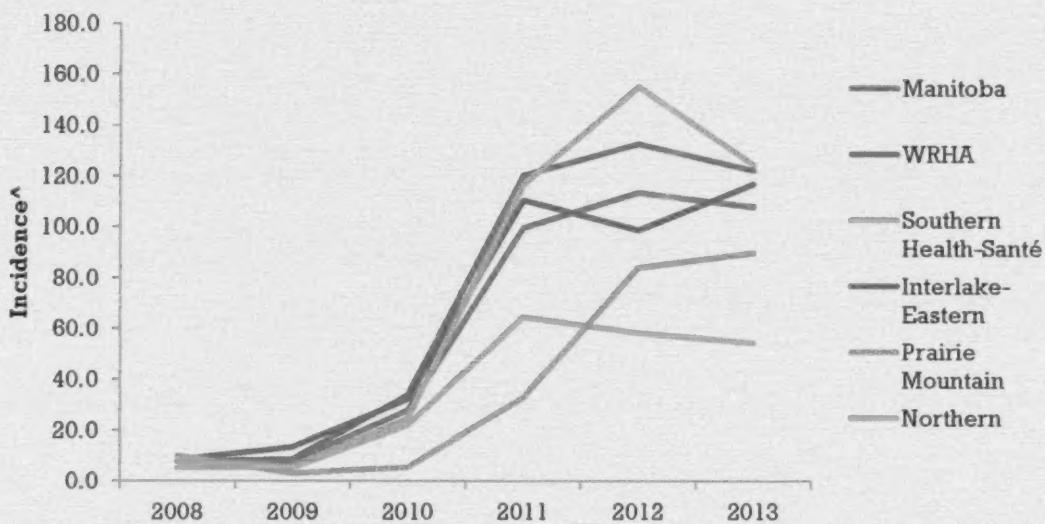
<sup>^</sup> Cases per 100,000 population

Figure 7: VRE by Age Group and Sex in Manitoba, 2013, (n=1388)

Figure 8 indicates Southern Health – Santé Sud and Prairie Mountain Health had the lowest VRE incidence rates of all the RHAs. In 2013, they had 54.4 and 89.8 cases per 100,000 population, respectively. The other three RHAs had higher rates, with about 120 cases per 100,000 population, in each region. The incidence rates for VRE increased considerably in all RHAs beginning in 2010 (Figure 9) - a trend seen nationally<sup>1</sup>. This may explain the large difference between the 2013 incidence and the 5-year average incidence.



<sup>^</sup> Cases per 100,000 population  
Figure 8: VRE by Regional Health Authority in Manitoba, 2013 and 5-year Average (2008-2012)



<sup>^</sup> Cases per 100,000 population  
Figure 9: VRE by Regional Health Authority in Manitoba, 2008-2013

<sup>1</sup> PHAC. Antimicrobial Resistant Organisms (ARO) Surveillance: Surveillance Report for Data from January 1, 2007 to December 31, 2011. Government of Canada. 2013.

## Enteric Diseases

Enteric disease (or illness) is defined as gastrointestinal infection or intoxication. Enteric diseases may be caused by chemicals or biological agents and/or their toxins including bacteria, viruses, protozoans, algae, fungi, and parasites. Enteric diseases are widely under-reported due to no or mild symptoms, short duration, lack of a physician visit, and the absence of laboratory diagnosis even when attending a physician<sup>2</sup>. In 2013, 15 enteric diseases were laboratory-confirmed in the province of Manitoba.

Table 6: Enteric Diseases in Manitoba, 2008-2013

Disease Name	2008		2009		2010		2011		2012		2013	
	Number of Cases	Incidence^										
Amebiasis	37	3.1	43	3.5	34	2.8	29	2.3	40	3.1	17	1.3
<i>Bacillus Cereus</i> Food Poisoning*	1	0.1	5	0.4	0	0.0	0	0.0	0	0.0	1	0.1
<i>Clostridium perfringens</i> R	1	0.1	3	0.2	1	0.1	4	0.3	2	0.2	7	0.5
Campylobacteriosis	220	18.3	236	19.4	245	19.9	290	23.2	250	19.7	210	16.3
Cholera*	0	0.0	0	0.0	0	0.0	1	0.1	0	0.0	0	0.0
Cryptosporidiosis	73	6.1	38	3.1	23	1.9	19	1.5	41	3.2	40	3.1
Cyclosporiasis*	1	0.1	1	0.1	1	0.1	2	0.2	0	0.0	2	0.2
Giardiasis	130	10.8	129	10.6	123	10.0	116	9.3	113	8.9	90	7.0
Hepatitis A <sup>R</sup>	10	0.8	11	0.9	8	0.7	7	0.6	4	0.3	11	0.9
Listeriosis*	5	0.4	2	0.2	4	0.3	5	0.4	4	0.3	2	0.2
Paratyphoid <sup>R</sup>	4	0.3	2	0.2	5	0.4	4	0.3	7	0.6	7	0.5
Salmonellosis	227	18.9	261	21.5	234	19.0	174	13.9	176	13.8	227	17.6
Shigellosis	30	2.5	24	2.0	52	4.2	29	2.3	75	5.9	23	1.8
Vibrio Parahaemolyticus*	0	0.0	0	0.0	3	0.2	0	0.0	2	0.2	2	0.2
Verotoxigenic <i>Escherichia Coli</i> (VTEC)	37	3.1	45	3.7	76	6.2	56	4.5	36	2.8	29	2.2
Yersiniosis*	16	1.3	8	0.7	7	0.6	11	0.9	9	0.7	5	0.4

<sup>^</sup> Cases per 100,000 population

\* Disease with a cell count ≤ 5 in 2013; will not have a detailed analyses performed (see Methods, page 4)

R Disease of rare occurrence (see Methods, page 4)

## Amebiasis

Table 7 shows the incidence for amebiasis in 2013 was about half the 5-year average incidence (1.3 cases per 100,000 population compared to 3.0 cases per 100,000 population) with 20 fewer cases in 2013 than in the 5-year average. Winnipeg Regional Health Authority (WRHA) experienced the highest incidence of amebiasis in 2013 with 1.8 cases per 100,000 population (Figure 10); Southern Health – Santé Sud experienced similar incidence rates with 1.6 cases per 100,000 population. Both Interlake-Eastern RHA and Northern RHA had no confirmed cases of amebiasis in 2013.

Table 7: Amebiasis in Manitoba, 2013 and 5-year Average (2008-2012)

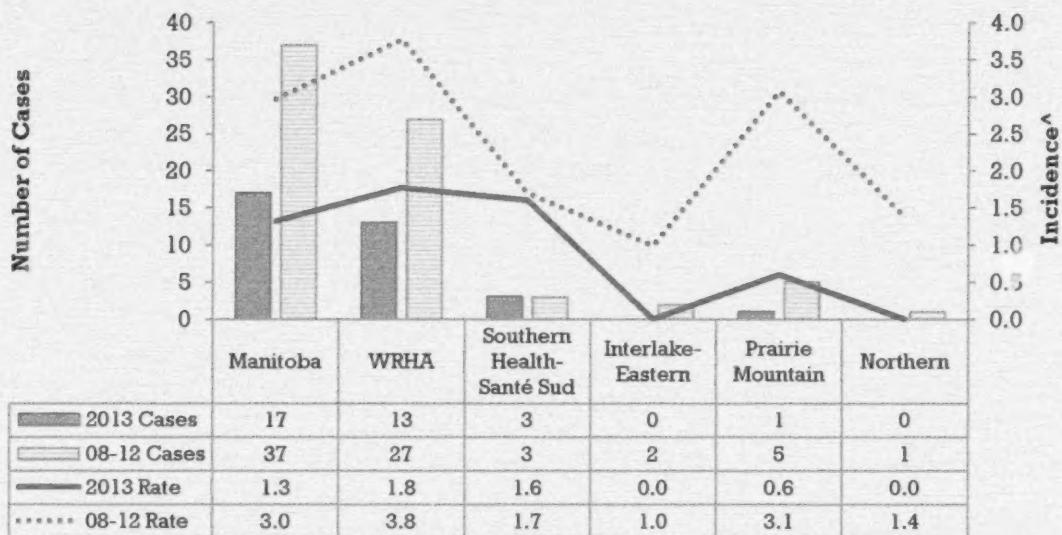
	2013	2008-2012
	Total	5-year Average
<b>Number of Cases</b>		
Overall	17	37
Male	9	22
Female	8	15
<b>Incidence<sup>A</sup></b>		
Overall	1.3	3.0
Male	1.4	3.5
Female	1.2	2.4
<b>Age at Onset (years)</b>		
Average	29.5	30.6
Median	33.7	29.4
Min. / Max.	(<1, 74.9)	(1.3, 85.5)

<sup>A</sup> Cases per 100,000 population

Table 8: Amebiasis by Age Group and Sex in Manitoba, 2013, (n=17)

Age Group	Female		Male	
	Number of Cases	Incidence <sup>A</sup>	Number of Cases	Incidence <sup>A</sup>
<1	0	0.0	1	11.8
1-4	1	3.1	0	0.0
5-9	1	2.5	1	2.4
10-14	1	2.6	0	0.0
15-19	1	2.3	0	0.0
20-24	0	0.0	0	0.0
25-29	1	2.2	0	0.0
30-39	2	2.4	6	7.2
40-59	0	0.0	1	0.6
Over 60	1	0.7	0	0.0

<sup>A</sup> Cases per 100,000 population



<sup>A</sup> Cases per 100,000 population

Figure 10: Amebiasis by Regional Health Authority in Manitoba, 2013 and 5-year Average (2008-2012)

### *Clostridium perfringens*

In this report, *Clostridium perfringens* is categorized as a disease of rare occurrence - there were seven confirmed cases in the province in 2013 (see Methods, page 4). While the 2013 incidence of *C. perfringens* was more than double the 5-year average incidence (Table 9), it was still very low at 0.5 cases per 100,000 population. The majority of cases (six out of seven) occurred in WRHA (Table 11). Historically, there were very low rates of *C. perfringens* in all RHAs. The highest 5-year average incidence occurred in Northern RHA with 0.6 cases per 100,000 population. In 2013, Southern Health – Santé Sud, Prairie Mountain Health, and Northern RHA had no confirmed cases of *C. perfringens*.

Table 9: *Clostridium perfringens* in Manitoba, 2013 and 5-year Average (2008-2012)

	2013	2008-2012
	Total	5-year Average
Number of Cases		
Overall	7	3
Male	2	2
Female	5	1
Incidence^		
Overall	0.5	0.2
Male	0.3	0.2
Female	0.8	0.1
Age at Onset (years)		
Average	60.0	61.4
Median	62.7	59.8
Min. /Max.	(1.0, 89.6)	(32.0, 86.4)

<sup>^</sup> Cases per 100,000 population

Table 10: *Clostridium perfringens* by Age Group and Sex in Manitoba, 2013, (n=7)

Age Group	Female		Male	
	Number of Cases	Incidence^	Number of Cases	Incidence^
<1	1	12.5	0	0.0
1-4	0	0.0	0	0.0
5-9	0	0.0	0	0.0
10-14	0	0.0	0	0.0
15-19	0	0.0	0	0.0
20-24	0	0.0	0	0.0
25-29	0	0.0	0	0.0
30-39	1	1.2	0	0.0
40-59	0	0.0	1	0.6
Over 60	3	2.2	1	0.9

<sup>^</sup> Cases per 100,000 population

Table 11: *Clostridium perfringens* by Regional Health Authority in Manitoba, 2013 and 5-year Average (2008-2012)

RHA	2013		2008-2012	
	Total		5-year Average	
	Number of Cases	Incidence^	Number of Cases	Incidence^
Manitoba	7	0.5	3	0.2
WRHA	6	0.8	1	0.1
Southern Health-Santé Sud	0	0.0	<1	0.1
Interlake-Eastern	1	0.8	<1	0.3
Prairie Mountain	0	0.0	1	0.4
Northern	0	0.0	<1	0.6

<sup>^</sup> Cases per 100,000 population

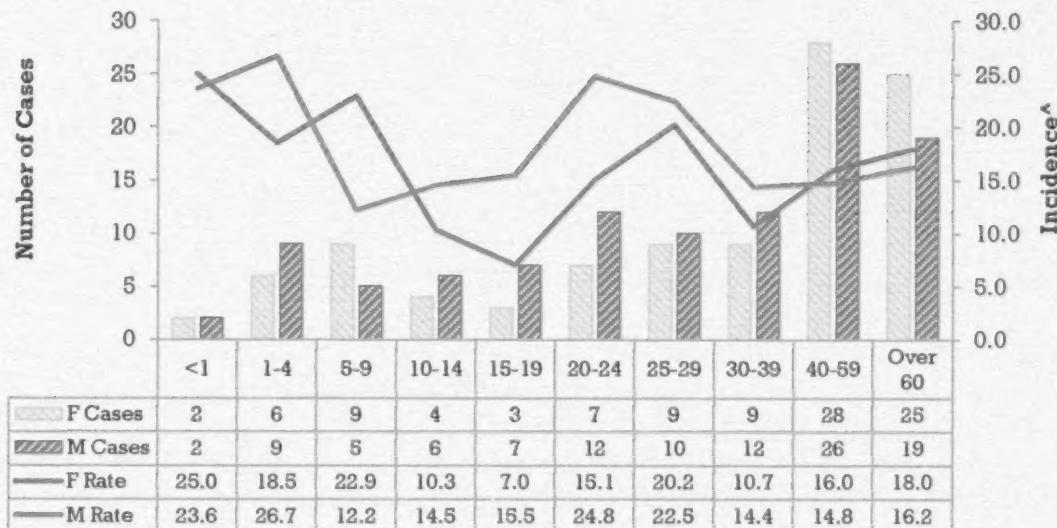
## Campylobacteriosis

In 2013, the incidence rates of campylobacteriosis fluctuated over the age groups and between the sexes with no identifiable trend (Figure 11). For females, the incidence rates ranged from 7.0 cases (15-19 years age group) to 25.0 cases (<1 age group) per 100,000 population, and for males the incidence rates ranged from 12.2 cases (5-9 years age group) to 26.7 cases (1-4 years age group) per 100,000 population. The 2013 provincial incidence rates for males and females were very close with males having only 1.2 more cases per 100,000 population than females.

Table 12: Campylobacteriosis in Manitoba, 2013 and 5-year Average (2008-2012)

	2013	2008-2012
	Total	5-year Average
Number of Cases		
Overall	210	249
Male	108	139
Female	102	110
Incidence <sup>A</sup>		
Overall	16.3	20.1
Male	16.9	22.7
Female	15.7	17.6
Age at Onset (years) <sup>1</sup>		
Average	38.7	35.2
Median	36.4	32.3
Min. / Max.	(<1, 93.3)	(<1, 95.3)

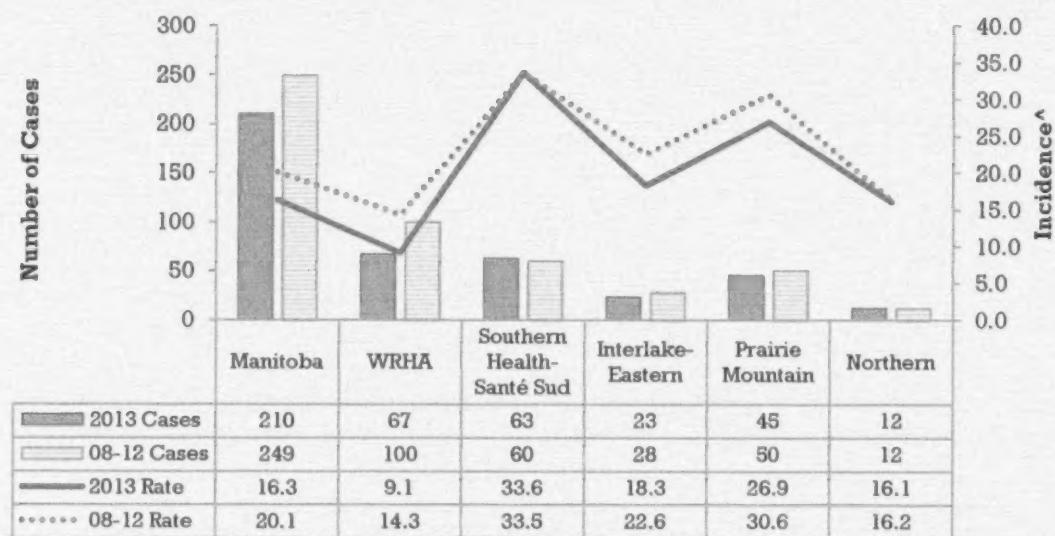
<sup>A</sup> Cases per 100,000 population



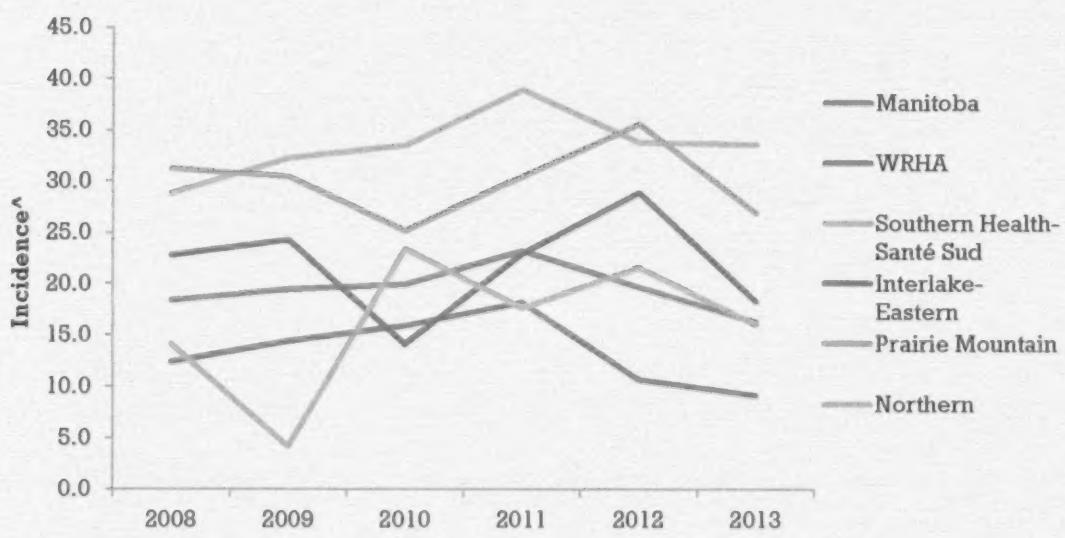
<sup>A</sup> Cases per 100,000 population

Figure 11: Campylobacteriosis by Age Group and Sex in Manitoba, 2013, (n=210)

Figure 12 shows Southern Health – Santé Sud had the highest rates of campylobacteriosis, both in 2013 and in the 5-year average (33.6 cases and 33.5 cases per 100,000 population, respectively). Conversely, WRHA had the lowest incidence rates of campylobacteriosis for both 2013 and the 5-year average (9.1 cases and 14.3 cases per 100,000 population, respectively). Southern Health – Santé Sud and Prairie Mountain Health consistently had campylobacteriosis incidence rates above the provincial incidence rate from 2008 to 2013 (Figure 13).



<sup>^</sup> Cases per 100,000 population  
Figure 12: Campylobacteriosis by Regional Health Authority in Manitoba, 2013 and 5-year Average (2008-2012)



<sup>^</sup> Cases per 100,000 population  
Figure 13: Campylobacteriosis by Regional Health Authority in Manitoba, 2008-2013

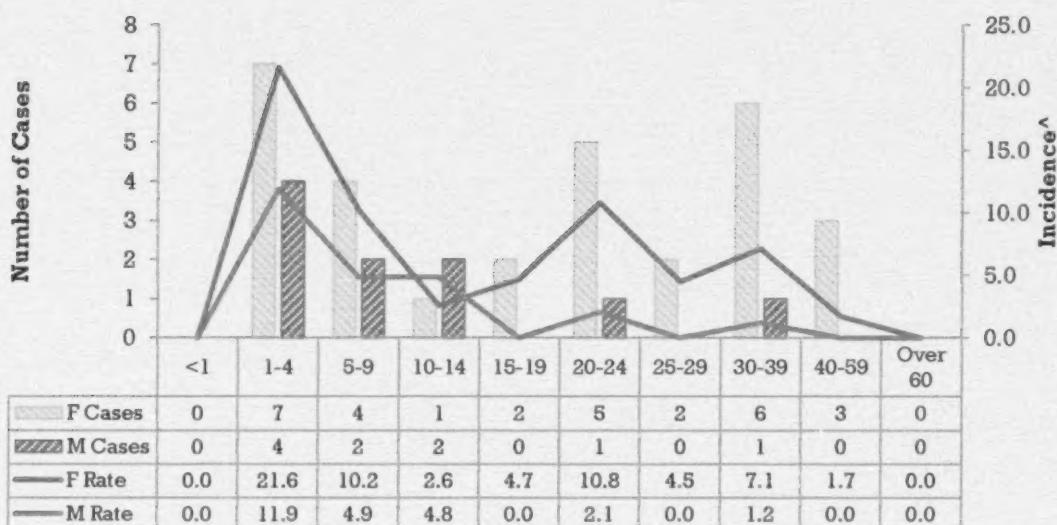
## Cryptosporidiosis

In 2013, three times as many females as males had confirmed cases of cryptosporidiosis (Table 13). This trend is not apparent in the 5-year average - males and females had similar incidence rates (3.0 cases per 100,000 males and 3.3 cases per 100,000 females). Figure 14 shows those in the 1-4 age group had the highest incidence of the disease in 2013, accounting for more than one-quarter (27.5%) of the cases in the province.

Table 13: Cryptosporidiosis in Manitoba, 2013 and 5-year Average (2008-2012)

	2013	2008-2012
	Total	5-year Average
Number of Cases		
Overall	40	39
Male	10	19
Female	30	21
Incidence <sup>A</sup>		
Overall	3.1	3.1
Male	1.6	3.0
Female	4.6	3.3
Age at Onset (years)		
Average	18.7	19.4
Median	14.3	16.4
Min. /Max.	(1.5, 59.8)	(<1, 75.1)

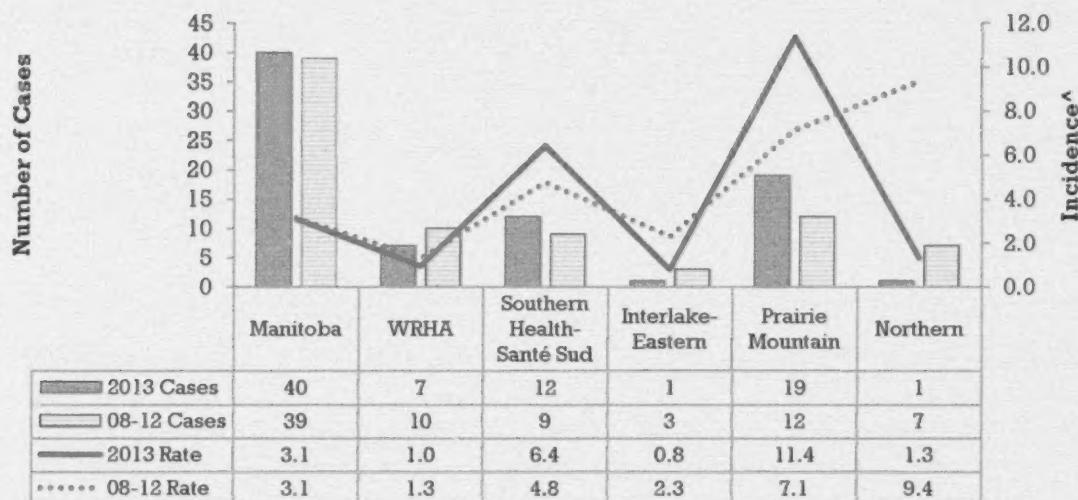
<sup>A</sup> Cases per 100,000 population



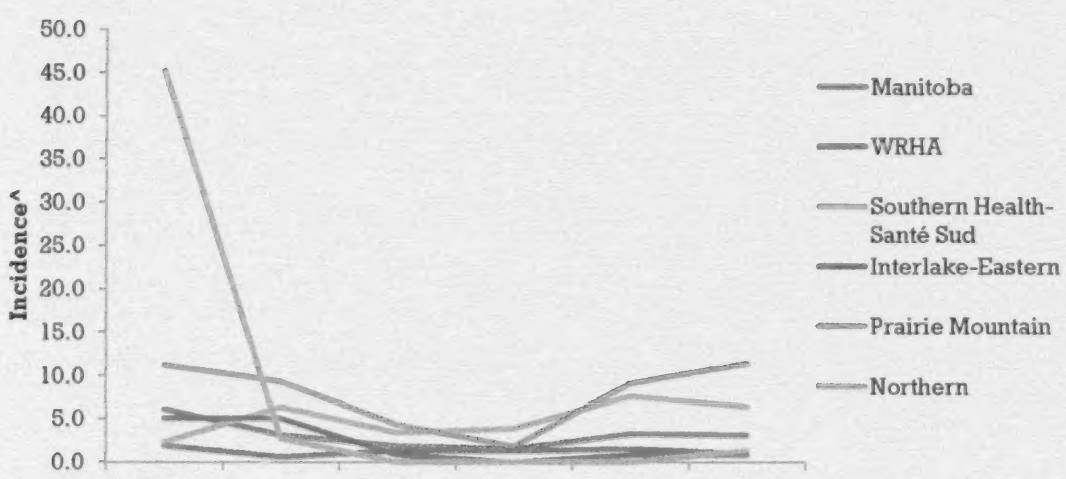
<sup>A</sup> Cases per 100,000 population

Figure 14: Cryptosporidiosis by Age Group and Sex in Manitoba, 2013, (n=40)

Prairie Mountain Health had the highest incidence rate in 2013 (11.4 cases per 100,000 population). Northern RHA had one of the lowest incidence rates in 2013 (1.3 cases per 100,000 population), but the highest 5-year average incidence rate (9.4 cases per 100,000 population). In 2008, Northern RHA experienced an outbreak of cryptosporidiosis in a community, of several months in duration, with over 100 confirmed cases. Figure 16 shows the spike in incidence associated with this outbreak, which contributed to Northern RHA's high 5-year average incidence.



<sup>^</sup> Cases per 100,000 population  
Figure 15: Cryptosporidiosis by Regional Health Authority in Manitoba, 2013 and 5-year Average (2008-2012)



<sup>^</sup> Cases per 100,000 population  
Figure 16: Cryptosporidiosis by Regional Health Authority in Manitoba, 2008-2013

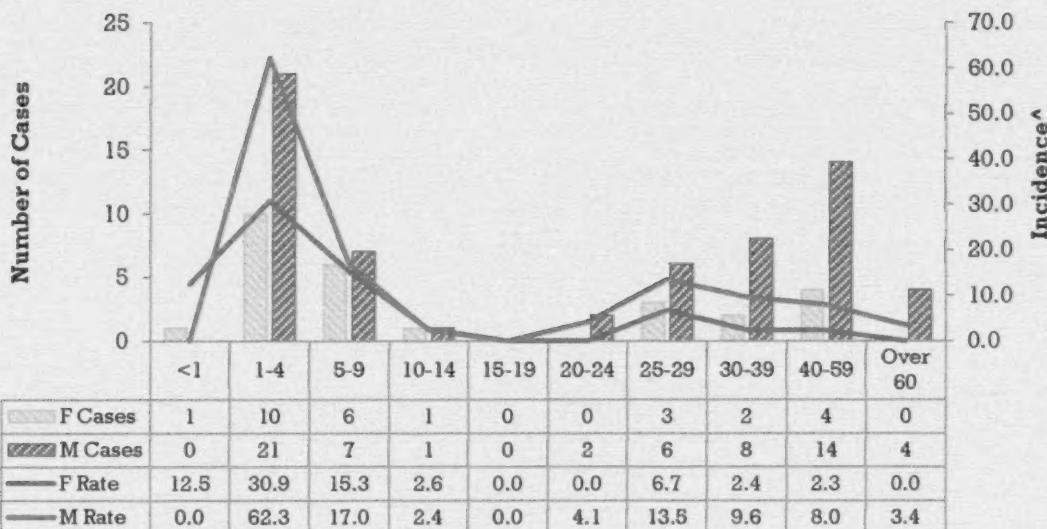
## Giardiasis

The average age of giardiasis onset was 22.9 years, with a median age of 9.4 years in 2013 (Table 14). This indicates the disease had a higher incidence for those under the age of 9, which is confirmed in Figure 17; the <1, 1-4, and 5-9 age groups had the highest incidence rates. Of these, the 1-4 age group had the highest incidence rate with 46.6 cases per 100,000 population. The 15-19 year olds had the lowest incidence with 0 cases occurring in this age group in 2013. In both 2013 and historically, more males than females contracted the disease.

Table 14: Giardiasis in Manitoba, 2013 and 5-year Average (2008-2012)

	2013	2008-2012
	Total	5-year Average
Number of Cases		
Overall	90	123
Male	63	66
Female	27	57
Incidence^		
Overall	7.0	9.9
Male	9.9	10.8
Female	4.2	9.1
Age at Onset (years)		
Average	22.9	23.7
Median	9.4	18.8
Min. /Max.	(<1, 85.3)	(<1, 90.1)

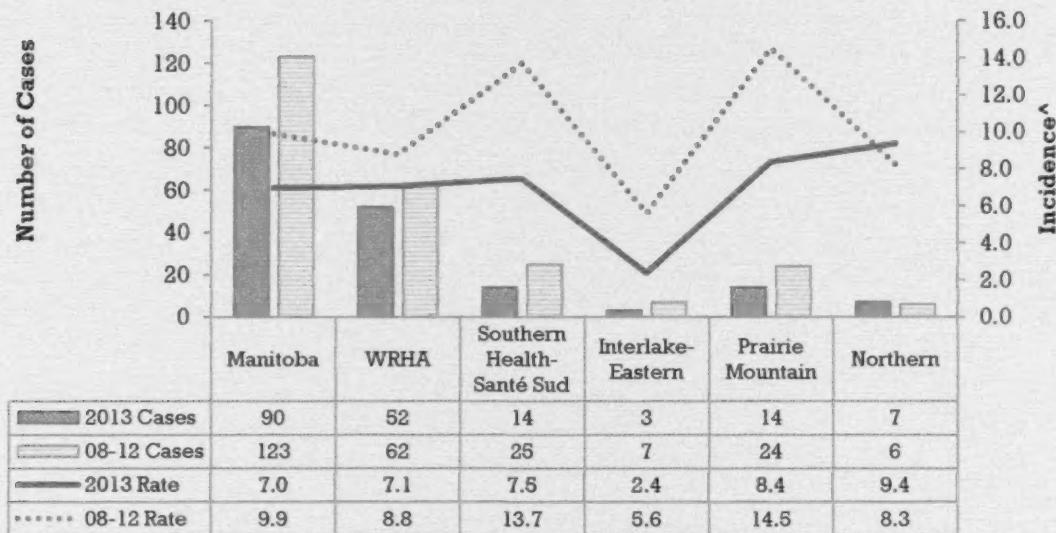
<sup>^</sup> Cases per 100,000 population



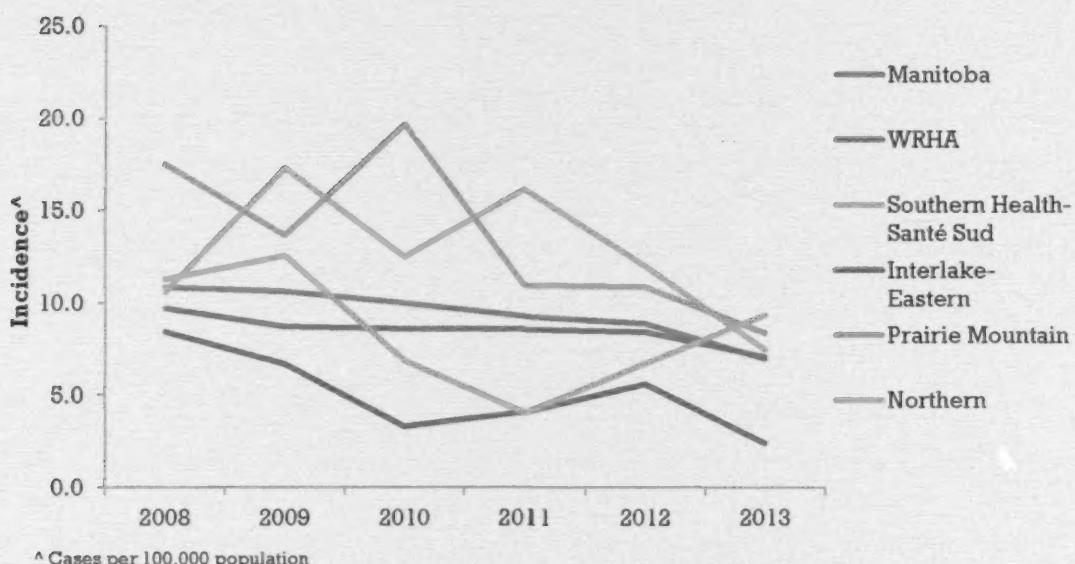
<sup>^</sup> Cases per 100,000 population

Figure 17: Giardiasis by Age Group and Sex in Manitoba, 2013, (n=90)

In 2013, Northern RHA had the highest incidence of giardiasis, with 9.4 cases per 100,000 population and Prairie Mountain Health had the highest 5-year average incidence with 14.5 cases per 100,000 population (Figure 18). Figure 19 shows the rates for each RHA were not stable over time, with the exception of WRHA whose incidence remained around 8 cases per 100,000 population over all six years. Figures 18 and 19 show Interlake-Eastern RHA consistently had the lowest incidence of the disease from 2008 to 2013.



<sup>^</sup> Cases per 100,000 population  
Figure 18: Giardiasis by Regional Health Authority in Manitoba, 2013 and 5-year Average (2008-2012)



<sup>^</sup> Cases per 100,000 population  
Figure 19: Giardiasis by Regional Health Authority in Manitoba, 2008-2013

### Hepatitis A

In 2013, there were 11 confirmed hepatitis A cases in the province which categorizes hepatitis A as a disease of rare occurrence (see Methods, page 4). In 2013, males experienced almost three times more cases of hepatitis A than females, a trend that was not reflected in the 5-year average (Table 15). Table 17 shows the majority of hepatitis A cases in 2013 (ten out of eleven) occurred in residents of WRHA. In Manitoba, cases of hepatitis A are often acquired outside of Canada; however the possibility of secondary transmission within the province does exist.

Table 15: Hepatitis A in Manitoba, 2013 and 5-year Average (2008-2012)

	2013	2008-2012
	Total	5-year Average
Number of Cases		
Overall	11	8
Male	8	5
Female	3	4
Incidence^		
Overall	0.9	0.6
Male	1.3	0.7
Female	0.5	0.6
Age at Onset (years)		
Average	25.0	32.3
Median	20.0	25.1
Min. / Max.	(5.2, 93.9)	(2.8, 82.6)

<sup>^</sup> Cases per 100,000 population

Table 16: Hepatitis A by Age Group and Sex in Manitoba, 2013, (n=11)

Age Group	Female		Male	
	Number of Cases	Incidence^	Number of Cases	Incidence^
<1	0	0.0	0	0.0
1-4	0	0.0	0	0.0
5-9	2	5.1	2	4.9
10-14	0	0.0	0	0.0
15-19	1	2.3	0	0.0
20-24	0	0.0	4	8.3
25-29	0	0.0	0	0.0
30-39	0	0.0	0	0.0
40-59	0	0.0	1	0.6
Over 60	0	0.0	1	0.9

<sup>^</sup> Cases per 100,000 population

Table 17: Hepatitis A by Regional Health Authority in Manitoba, 2013 and 5-year Average (2008-2012)

RHA	2013		2008-2012	
	Total		5-year Average	
	Number of Cases	Incidence^	Number of Cases	Incidence^
Manitoba	11	0.9	8	0.6
WRHA	10	1.4	5	0.7
Southern Health-Santé Sud	0	0.0	1	0.5
Interlake-Eastern	0	0.0	1	0.5
Prairie Mountain	1	0.6	2	0.9
Northern	0	0.0	<1	0.3

<sup>^</sup> Cases per 100,000 population

## Paratyphoid

Paratyphoid is categorized as a disease of rare occurrence (see Methods, page 4); in 2013, there were seven confirmed cases in the province. This is equivalent to 0.5 cases per 100,000 individuals (Table 18). The majority of cases (six out of seven in 2013) occurred in WRHA, a trend which is also apparent in the 5-year average (Table 20). In Manitoba, paratyphoid is usually acquired by travel outside of Canada, but it is possible for secondary transmission to occur within the province.

Table 18: Paratyphoid in Manitoba, 2013 and 5-year Average (2008-2012)

	2013	2008-2012
	Total	5-year Average
Number of Cases		
Overall	7	5
Male	4	3
Female	3	2
Incidence <sup>^</sup>		
Overall	0.5	0.4
Male	0.6	0.4
Female	0.5	0.3
Age at Onset (years)		
Average	28.1	30.1
Median	20.5	25.1
Min. /Max.	(4.9, 79.6)	(<1, 73.3)

<sup>^</sup> Cases per 100,000 population

Table 19: Paratyphoid by Age Group and Sex in Manitoba, 2013, (n=7)

Age Group	Female		Male	
	Number of Cases	Incidence <sup>^</sup>	Number of Cases	Incidence <sup>^</sup>
<1	0	0.0	0	0.0
1-4	0	0.0	1	3.0
5-9	0	0.0	0	0.0
10-14	2	5.2	0	0.0
15-19	0	0.0	0	0.0
20-24	1	2.2	1	2.1
25-29	0	0.0	0	0.0
30-39	0	0.0	0	0.0
40-59	0	0.0	1	0.6
Over 60	0	0.0	1	0.9

<sup>^</sup> Cases per 100,000 population

Table 20: Paratyphoid by Regional Health Authority in Manitoba, 2013 and 5-year Average (2008-2012)

RHA	2013		2008-2012	
	Total		5-year Average	
	Number of Cases	Incidence^	Number of Cases	Incidence^
Manitoba	7	0.5	5	0.4
WRHA	6	0.8	4	0.5
Southern Health-Santé Sud	0	0.0	<1	0.1
Interlake-Eastern	0	0.0	1	0.8
Prairie Mountain	1	0.6	0	0.0
Northern	0	0.0	0	0.0

<sup>^</sup> Cases per 100,000 population

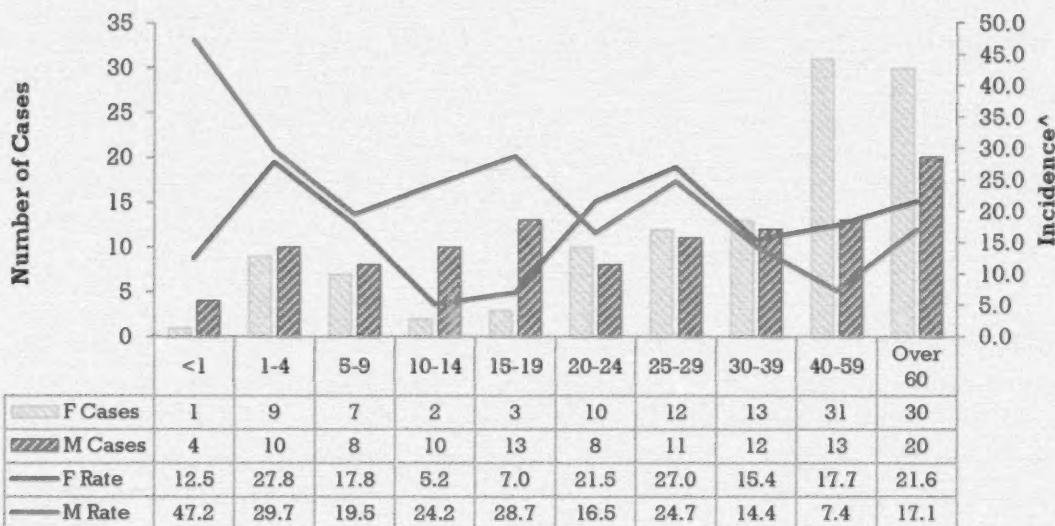
## Salmonellosis

Figure 20 shows males under the age of one had the highest incidence of salmonellosis in 2013 (47.2 cases per 100,000 males in the population), much higher than the incidence of their female counter-parts (12.5 cases per 100,000 females in the population). In 2013, males and females in the province had very similar rates (Table 21), despite variations between the sexes, across the age groups.

Table 21: Salmonellosis in Manitoba, 2013 and 5-year Average (2008-2012)

	2013	2008-2012
	Total	5-year Average
<b>Number of Cases</b>		
Overall	227	215
Male	109	110
Female	118	106
<b>Incidence<sup>a</sup></b>		
Overall	17.6	17.4
Male	17.1	17.9
Female	18.1	16.9
<b>Age at Onset (years)</b>		
Average	36.7	36.6
Median	33.0	34.2
Min. /Max.	(<1, 93.9)	(<1, 96.4)

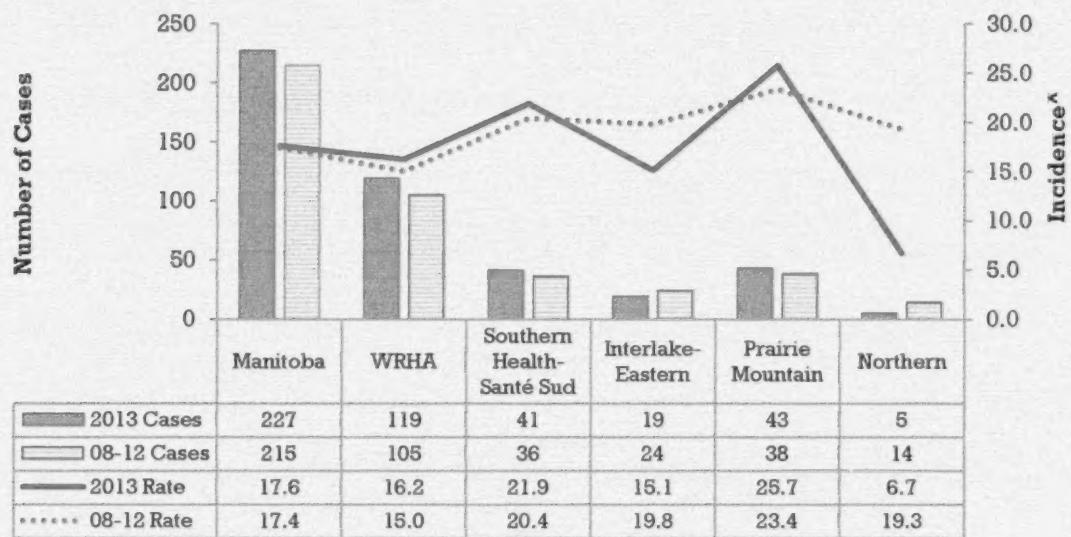
<sup>a</sup> Cases per 100,000 population



<sup>a</sup> Cases per 100,000 population

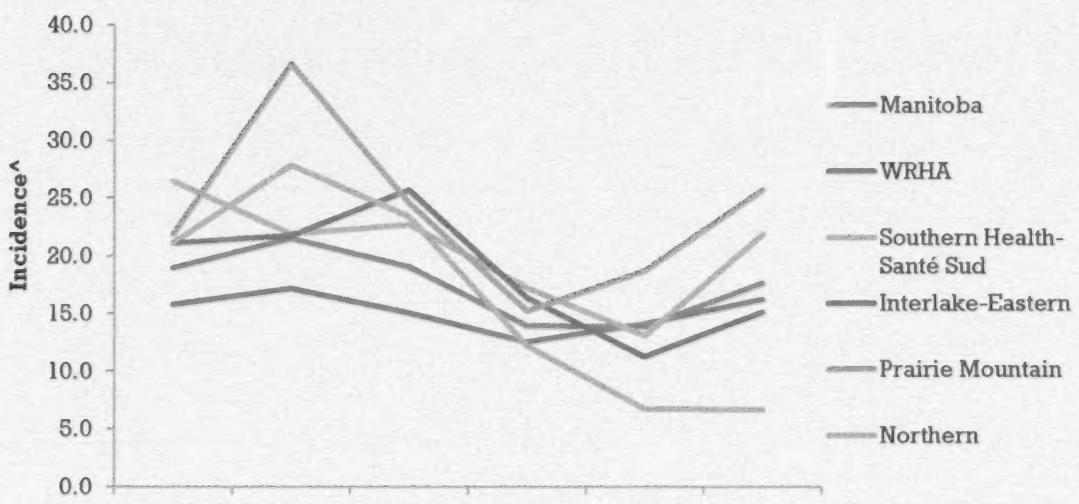
Figure 20: Salmonellosis by Age Group and Sex in Manitoba, 2013, (n=227)

Figure 21 shows Prairie Mountain Health had the highest incidence rates in both 2013 and the 5-year average (25.7 cases and 23.4 cases per 100,000 population, respectively). Northern RHA's incidence in 2013 (6.7 cases per 100,000 population) was much lower than its incidence for the 5-year average (19.3 cases per 100,000 population). Figure 22 indicates all RHAs experienced a decrease in incidence rates from 2010 to 2012, with a slight increase in 2013.



<sup>^</sup> Cases per 100,000 population

Figure 21: Salmonellosis by Regional Health Authority in Manitoba, 2013 and 5-year Average (2008-2012)



<sup>^</sup> Cases per 100,000 population

Figure 22: Salmonellosis by Regional Health Authority in Manitoba, 2008-2013

## Shigellosis

The incidence rate for shigellosis in 2013 (1.8 cases per 100,000 population) was half the incidence rate of the 5-year average (3.4 cases per 100,000 population) (Table 22). In 2013, both the average age of disease onset, and the median age of disease onset were larger than their 5-year average counterparts. These increases suggest that while there were fewer cases overall in 2013, a larger proportion of the cases occurred in older people than in previous years.

Table 22: Shigellosis in Manitoba, 2013 and 5-year Average (2008-2012)

	2013	2008-2012
	Total	5-year Average
Number of Cases		
Overall	23	42
Male	11	22
Female	12	21
Incidence <sup>^</sup>		
Overall	1.8	3.4
Male	1.7	3.5
Female	1.8	3.3
Age at Onset (years)		
Average	35.8	22.1
Median	29.4	12.8
Min. /Max.	(4.8, 76.8)	(<1, 78.1)

<sup>^</sup> Cases per 100,000 population

Table 23: Shigellosis by Age Group and Sex in Manitoba, 2013, (n=23)

Age Group	Female		Male	
	Number of Cases	Incidence <sup>^</sup>	Number of Cases	Incidence <sup>^</sup>
<1	0	0.0	0	0.0
1-4	1	3.1	0	0.0
5-9	1	2.5	1	2.4
10-14	0	0.0	0	0.0
15-19	2	4.7	0	0.0
20-24	3	6.5	2	4.1
25-29	1	2.2	1	2.2
30-39	1	1.2	0	0.0
40-59	0	0.0	5	2.8
Over 60	3	2.2	2	1.7

<sup>^</sup> Cases per 100,000 population

There were very low incidence rates of shigellosis across all RHAs in 2013 (Figure 23). Of interest is the large difference between Northern RHA's 2013 rate and the 5-year average rate (8.0 cases per 100,000 population compared to 26.2 cases per 100,000 population, respectively). Figure 24 reveals Northern RHA had very unstable Shigellosis incidence rates from 2008 to 2013, fluctuating between high rates and low rates, but consistently having a higher incidence than the other RHAs over all six years. Northern RHA's incidence rates are strongly influenced by the small population size of the region; a small change in the number of confirmed cases can create a large change in incidence.

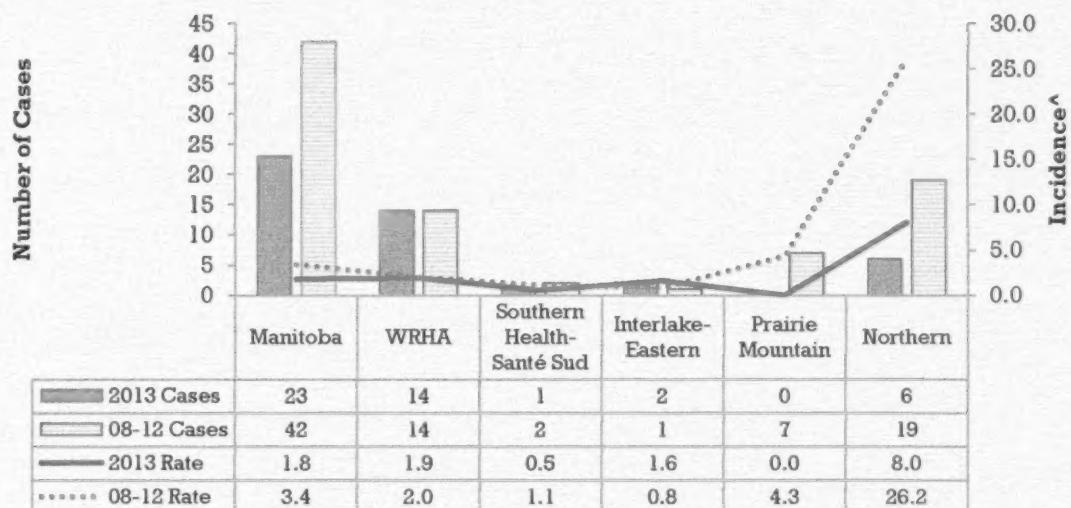


Figure 23: Shigellosis by Regional Health Authority in Manitoba, 2013 and 5-year Average (2008-2012)

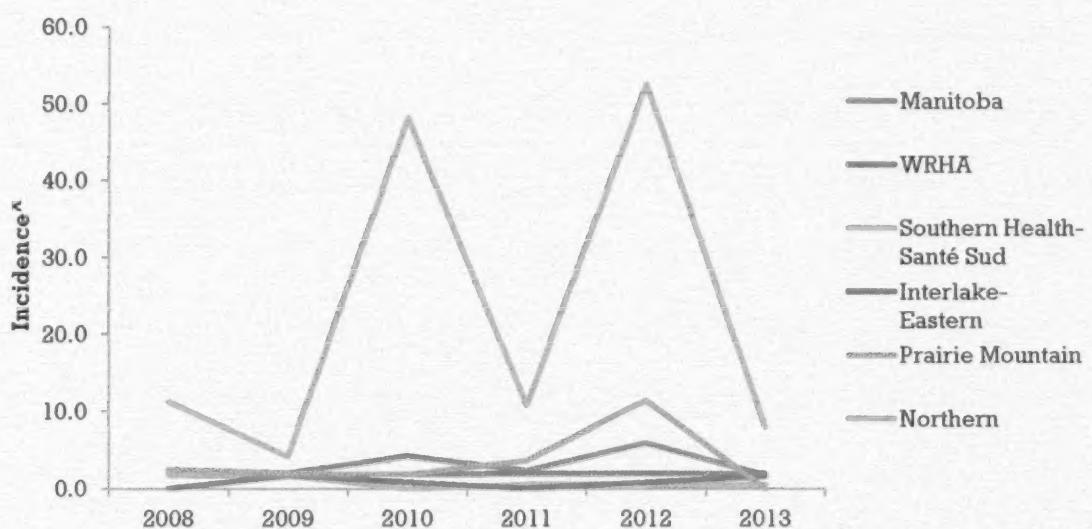


Figure 24: Shigellosis by Regional Health Authority in Manitoba, 2008-2013

### Verotoxigenic *Escherichia coli* (VTEC)

The VTEC incidence rate in 2013 (2.2 cases per 100,000 population) was about half the 5-year average incidence rate (4.1 cases per 100,000 population) (Table 24). Despite a decrease in incidence, there was little change in the age composition of the population contracting the disease; the average age at onset was exactly the same (29.3 years) for both 2013 and the 5-year average, with similar medians in both periods. Table 25 shows the incidence rate for male infants (<1 year) was high with 23.6 cases per 100,000 population. Only two cases of VTEC occurred in this group, but the small size of the population contributes to the rate appearing conspicuously large.

Table 24: VTEC in Manitoba, 2013 and 5-year Average (2008-2012)

	2013	2008-2012
	Total	5-year Average
<b>Number of Cases</b>		
Overall	29	50
Male	17	24
Female	12	26
<b>Incidence<sup>^</sup></b>		
Overall	2.2	4.1
Male	2.7	3.9
Female	1.8	4.2
<b>Age at Onset (years)</b>		
Average	29.3	29.3
Median	22.9	23.8
Min. /Max.	(<1, 78.3)	(<1, 85.3)

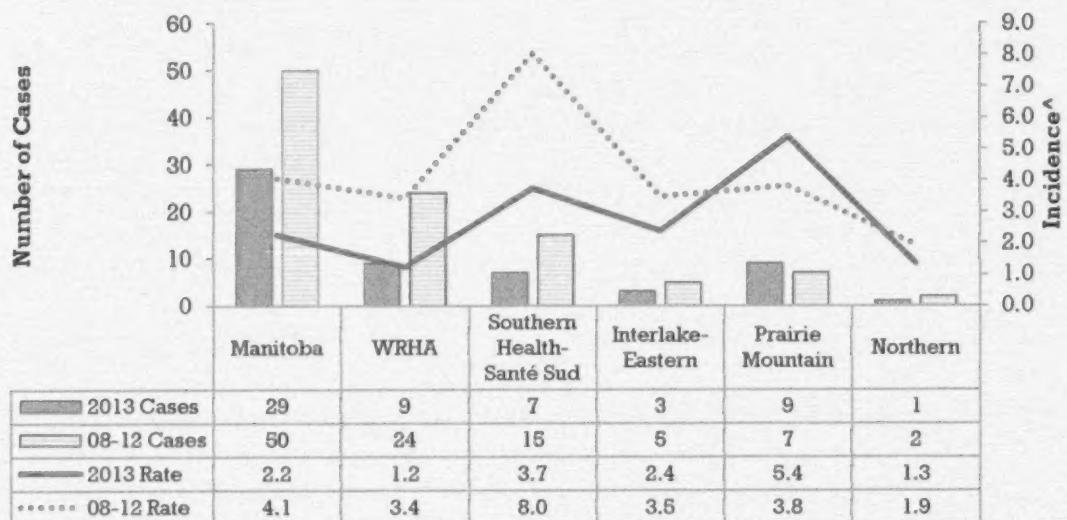
<sup>^</sup> Cases per 100,000 population

Table 25: VTEC by Age Group and Sex in Manitoba, 2013, (n=29)

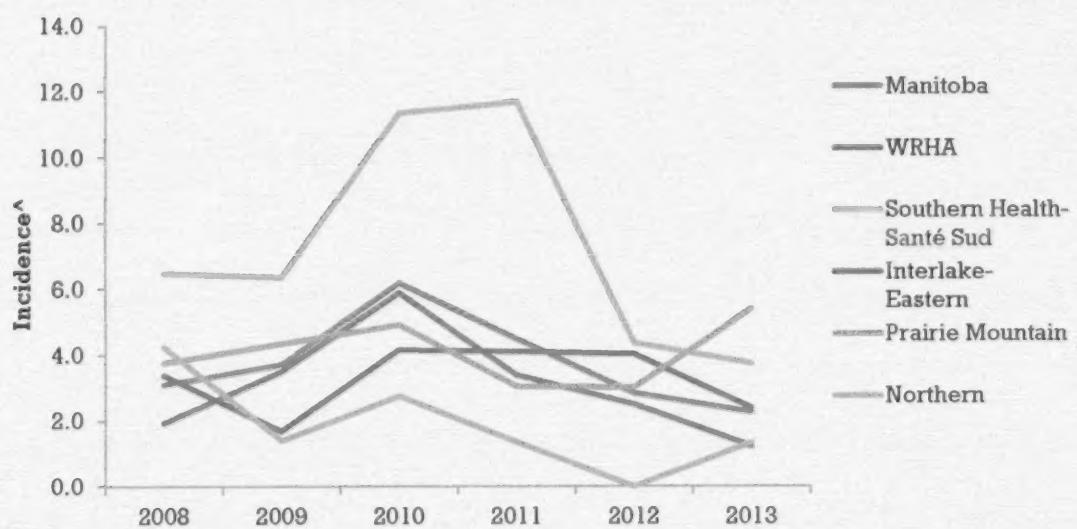
Age Group	Female		Male	
	Number of Cases	Incidence <sup>^</sup>	Number of Cases	Incidence <sup>^</sup>
<1	0	0.0	2	23.6
1-4	0	0.0	0	0.0
5-9	0	0.0	3	7.3
10-14	1	2.6	1	2.4
15-19	3	7.0	1	2.2
20-24	3	6.5	3	6.2
25-29	0	0.0	2	4.5
30-39	2	2.4	1	1.2
40-59	2	1.1	2	1.1
Over 60	1	0.7	2	1.7

<sup>^</sup> Cases per 100,000 population

The highest incidence of VTEC in 2013 occurred in Prairie Mountain Health (5.4 cases per 100,000 population), but Southern Health – Santé Sud had the highest incidence for the 5-year average (8.0 cases per 100,000 population) (Figure 25). Figure 26 shows Southern Health-Santé Sud had the highest incidence of VTEC, among all RHAs, from 2008 to 2012, only dipping below Prairie Mountain Health's incidence rate in 2013.



<sup>a</sup> Cases per 100,000 population  
Figure 25: VTEC by Regional Health Authority in Manitoba, 2013 and 5-year Average (2008-2012)



<sup>a</sup> Cases per 100,000 population  
Figure 26: VTEC by Regional Health Authority in Manitoba, 2008-2013

## Vaccine Preventable Diseases

Vaccine preventable diseases (VPDs) are those communicable diseases that are preventable through immunization. In 2013, six VPDs were confirmed in Manitoba: *Haemophilus influenzae*, invasive meningococcal disease (IMD), invasive pneumococcal disease (IPD), mumps, pertussis, and typhoid.

Table 26: Vaccine Preventable Diseases in Manitoba, 2008-2013

Disease Name	2008	2009	2010	2011	2012	2013				
	Number of Cases	Incidence^								
Diphtheria*	1	0.1	1	0.1	1	0.1	1	0.1	0	0.0
<i>Haemophilus influenzae</i> <sup>R</sup>	17	1.4	8	0.7	12	1.0	14	1.1	14	1.1
Invasive Meningococcal Disease (IMD) <sup>R</sup>	5	0.4	6	0.5	10	0.8	2	0.2	2	0.2
Invasive Pneumococcal Disease (IPD)	125	10.4	136	11.2	175	14.2	130	10.4	153	12.0
Measles*	0	0.0	0	0.0	1	0.1	0	0.0	0	0.0
Mumps*	2	0.2	4	0.3	2	0.2	7	0.6	6	0.5
Pertussis <sup>R</sup>	14	1.2	29	2.4	53	4.3	30	2.4	119	9.4
Rubella, Congenital*	0	0.0	0	0.0	0	0.0	1	0.1	0	0.0
Rubella, Confirmed*	0	0.0	2	0.2	2	0.2	0	0.0	1	0.1
Typhoid*	4	0.3	6	0.5	6	0.5	8	0.6	6	0.5

<sup>A</sup> Cases per 100,000 population

\* Disease with a cell count ≤ 5 in 2013; will not have a detailed analyses performed (see Methods, page 4)

<sup>R</sup> Disease of rare occurrence (see Methods, page 4)

### Note:

MHHS produces an annual *Manitoba Immunization Monitoring System (MIMS)* report, which provides information on childhood vaccines (those received between ages 1 and 17). It includes the immunization status of children in Manitoba: overall, by immunogen, by RHA, and by continuous and non-continuous resident status; it also includes the appropriate immunization schedule for each age group. The *MIMS* report can be found on the Epidemiology and Surveillance website:

<http://www.gov.mb.ca/health/publichealth/surveillance/mims/index.html>

### *Haemophilus influenzae*

In 2013, there were fourteen confirmed *Haemophilus influenzae* cases in the province (including all “type-able” strains), categorizing *Haemophilus influenzae* as a disease of rare occurrence (see Methods, page 4). Table 27 shows the incidence of this disease was split perfectly between males and females (1.1 cases per 100,000 population for both males and females in 2013). The average age of disease onset in 2013 was 40.6 years, but 27.5 years for the 5-year average. The median ages of onset in 2013 and the 5-year average were also very different (50.7 years and 6.8 years, respectively). These large differences may indicate the disease was acquired mainly by older adults and younger children. Table 28 reflects this idea, as all cases occurred either in adults 40 years old, and older, or in children 4 years old, and younger. Northern RHA had the highest incidence in both 2013 and the 5-year average with just over 5 cases per 100,000 population (Table 29).

Table 27: *Haemophilus influenzae* in Manitoba, 2013 and 5-year Average (2008-2012)

	2013	2008-2012
	Total	5-year Average
Number of Cases		
Overall	14	13
Male	7	7
Female	7	7
Incidence <sup>^</sup>		
Overall	1.1	1.1
Male	1.1	1.1
Female	1.1	1.0
Age at Onset (years)		
Average	40.6	27.5
Median	50.7	6.8
Min. /Max.	(<1, 80.6)	(0.0, 89.2)

<sup>^</sup> Cases per 100,000 population

Table 28: *Haemophilus influenzae* by Age Group and Sex in Manitoba, 2013, (n=14)

Age Group	Female		Male	
	Number of Cases	Incidence <sup>^</sup>	Number of Cases	Incidence <sup>^</sup>
<1	2	25.0	2	23.6
1-4	0	0.0	1	3.0
5-9	0	0.0	0	0.0
10-14	0	0.0	0	0.0
15-19	0	0.0	0	0.0
20-24	0	0.0	0	0.0
25-29	0	0.0	0	0.0
30-39	0	0.0	0	0.0
40-59	2	1.1	1	0.6
Over 60	3	2.2	3	2.6

<sup>^</sup> Cases per 100,000 population

Table 29: *Haemophilus influenzae* by Regional Health Authority in Manitoba, 2013 and 5-year Average (2008-2012)

RHA	2013		2008-2012	
	Total		5-year Average	
	Number of Cases	Incidence^	Number of Cases	Incidence^
Manitoba	14	1.1	13	1.1
WRHA	3	0.4	7	0.9
Southern Health-Santé Sud	1	0.5	2	0.8
Interlake-Eastern	3	2.4	1	0.5
Prairie Mountain	3	1.8	1	0.6
Northern	4	5.4	4	5.2

<sup>^</sup> Cases per 100,000 population

## Invasive Meningococcal Disease (IMD)

In 2013, there were seven confirmed cases of IMD in the province, categorizing IMD as a disease of rare occurrence (see Methods, page 4). The average age at onset for IMD in 2013 was 17.5 years, over sixteen years below that of the 5-year average (33.9 years) (Table 30). Large differences like this are to be expected when cell counts are low.

Table 30: IMD in Manitoba, 2013 and 5-year Average (2008-2012)

	2013	2008-2012
	Total	5-year Average
<b>Number of Cases</b>		
Overall	9	5
Male	3	3
Female	6	3
<b>Incidence<sup>A</sup></b>		
Overall	0.7	0.4
Male	0.5	0.4
Female	0.9	0.4
<b>Age at Onset (years)</b>		
Average	17.5	33.9
Median	3.3	22.7
Min./Max.	(<1, 70.3)	(<1, 87.0)

<sup>A</sup> Cases per 100,000 population

Table 31: IMD by Age Group and Sex in Manitoba, 2013, (n=9)

Age Group	Female		Male	
	Number of Cases	Incidence <sup>A</sup>	Number of Cases	Incidence <sup>A</sup>
<1	0	0.0	1	11.8
1-4	4	12.3	0	0.0
5-9	0	0.0	0	0.0
10-14	0	0.0	0	0.0
15-19	1	2.3	0	0.0
20-24	0	0.0	1	2.1
25-29	0	0.0	0	0.0
30-39	1	1.2	0	0.0
40-59	0	0.0	0	0.0
Over 60	0	0.0	1	0.9

<sup>A</sup> Cases per 100,000 population

Table 32: IMD by Regional Health Authority in Manitoba, 2013 and 5-year Average (2008-2012)

RHA	2013		2008-2012	
	Total		5-year Average	
	Number of Cases	Incidence^	Number of Cases	Incidence^
Manitoba	9	0.7	5	0.4
WRHA	4	0.5	3	0.3
Southern Health-Santé Sud	3	1.6	1	0.6
Interlake-Eastern	0	0.0	1	0.7
Prairie Mountain	2	1.2	0	0.0
Northern	0	0.0	1	1.1

<sup>^</sup> Cases per 100,000 population

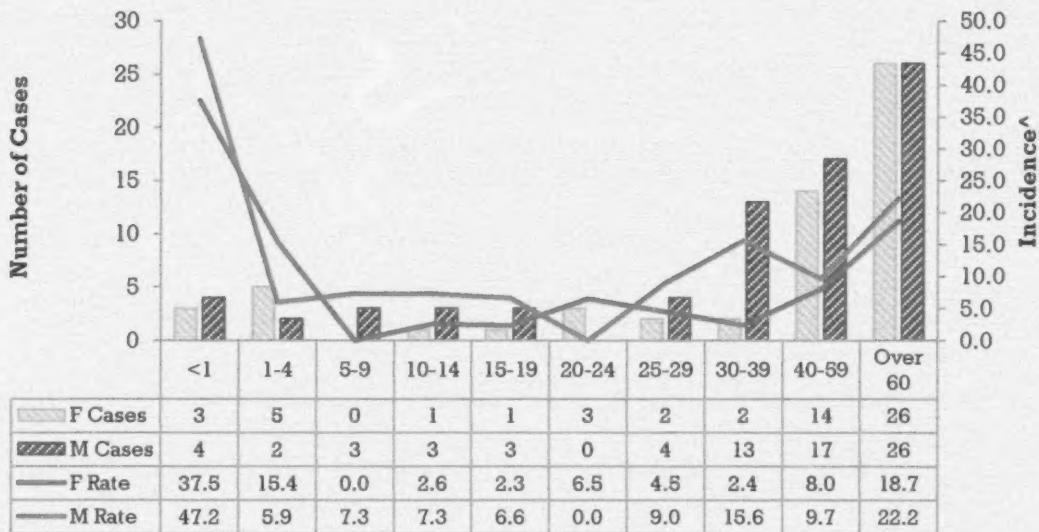
## Invasive Pneumococcal Disease (IPD)

In 2013, the largest incidence rate of IPD occurred in infants (<1 year). Figure 27 shows 37.5 cases per 100,000 females and 47.2 cases per 100,000 males were confirmed for this age group – that is, 42.5 cases per 100,000 infant population. The incidence rates were fairly low for all other age groups but increased in the over 60 age group (18.7 cases per 100,000 females and 22.2 cases per 100,000 males). Infants had the highest rates in 2013 but their cases accounted for only about 5% of the total number of IPD cases in the province; this age group had large rates due to its small population size.

Table 33: IPD in Manitoba, 2013 and 5-year Average (2008-2012)

	2013	2008-2012
	Total	5-year Average
Number of Cases		
Overall	132	144
Male	75	76
Female	57	69
Incidence^		
Overall	10.2	11.7
Male	11.7	12.4
Female	8.8	10.9
Age at Onset (years)		
Average	48.9	46.7
Median	51.2	49.8
Min. /Max.	(<1, 95.9)	(0.0, 100.2)

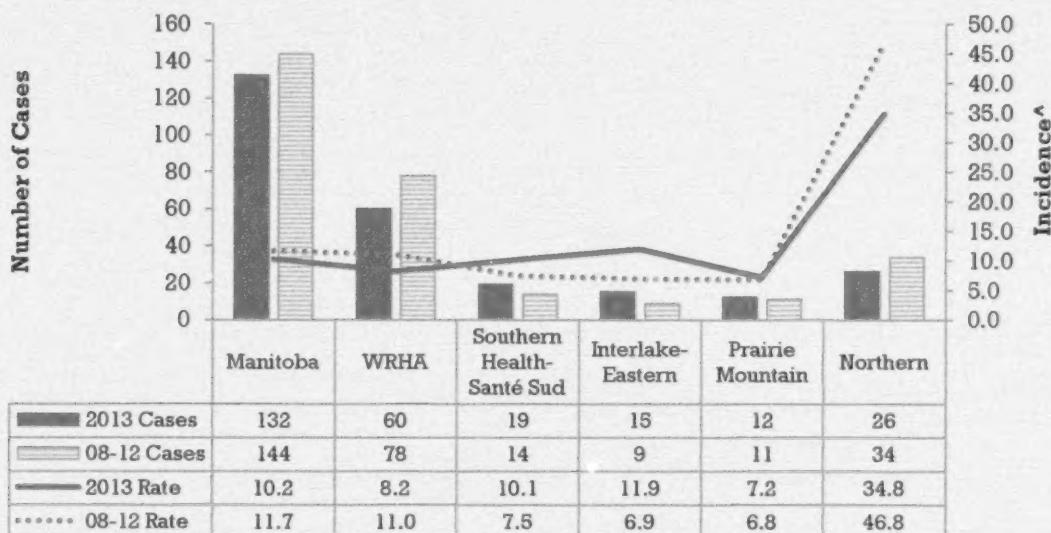
<sup>^</sup> Cases per 100,000 population



<sup>^</sup> Cases per 100,000 population

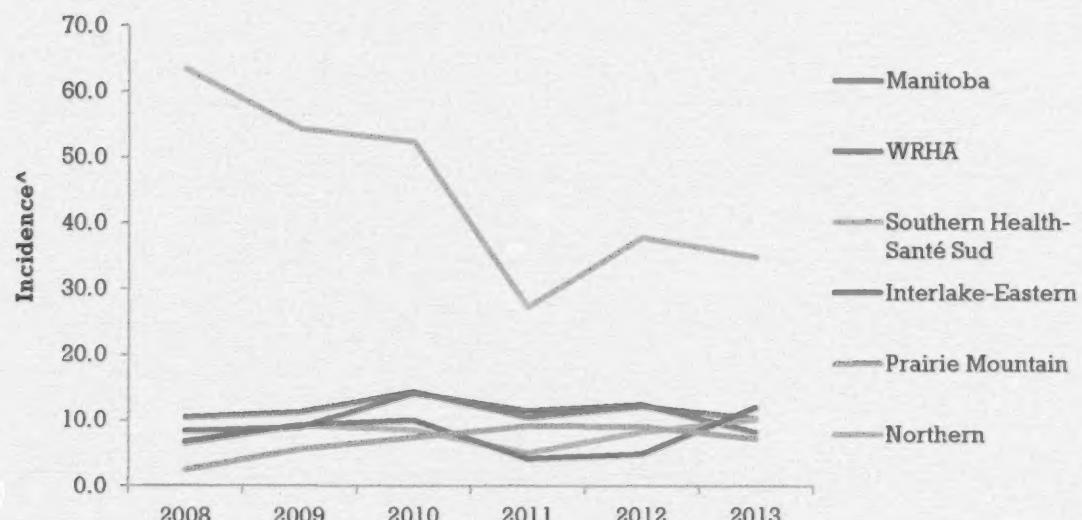
Figure 27: IPD by Age Group and Sex in Manitoba, 2013, (n=132)

The incidence rates for IPD were highest in Northern RHA for both 2013 and the 5-year average, with 34.8 cases per 100,000 population in 2013 (Figure 28). Incidence rates in Northern RHA were consistently higher than in the other RHAs between 2008 and 2013. However, the incidence rate for Northern RHA decreased by about 30 cases per 100,000 population between 2008 and 2013 while the other four RHAs' incidence rates remained fairly constant over the six years (Figure 29).



<sup>a</sup> Cases per 100,000 population

Figure 28: IPD by Regional Health Authority in Manitoba, 2013 and 5-year Average (2008-2012)



<sup>a</sup> Cases per 100,000 population

Figure 29: IPD by Regional Health Authority in Manitoba, 2008-2013

## Pertussis

In 2013, there were seven cases of pertussis in the province, categorizing pertussis as a disease of rare occurrence (see Methods, page 4). The age range of those diagnosed with pertussis was large, but Table 34 shows the average age, and especially the median age, were low. In 2013, 4 of the 6 pertussis cases occurred in females under the age of one, resulting in an incidence of 50.1 cases per 100,000 population for that age group. This incidence was much larger than any seen in the other age groups. Of interest is the large difference between the 2013 incidence rate and the 5-year average incidence rate (0.5 cases per 100,000 population versus 4.0 cases per 100,000 population).

Table 34: Pertussis in Manitoba, 2013 and 5-year Average (2008-2012)

	2013	2008-2012
	Total	5-year Average
Number of Cases		
Overall	7	49
Male	1	25
Female	6	25
Incidence <sup>^</sup>		
Overall	0.5	4.0
Male	0.2	4.0
Female	0.9	4.0
Age at Onset (years)		
Average	16.8	8.3
Median	1.0	1.5
Min./Max.	(<1, 91.9)	(<1, 91.7)

<sup>^</sup> Cases per 100,000 population

Table 35: Pertussis by Age Group and Sex in Manitoba, 2013, (n=7)

Age Group	Female		Male	
	Number of Cases	Incidence <sup>^</sup>	Number of Cases	Incidence <sup>^</sup>
<1	4	50.1	0	0.0
1-4	0	0.0	1	3.0
5-9	0	0.0	0	0.0
10-14	0	0.0	0	0.0
15-19	0	0.0	0	0.0
20-24	1	2.2	0	0.0
25-29	0	0.0	0	0.0
30-39	0	0.0	0	0.0
40-59	0	0.0	0	0.0
Over 60	1	0.7	0	0.0

<sup>^</sup> Cases per 100,000 population

Table 36: Pertussis by Regional Health Authority in Manitoba, 2013 and 5-year Average (2008-2012)

RHA	2013		2008-2012	
	Total		5-year Average	
	Number of Cases	Incidence <sup>^</sup>	Number of Cases	Incidence <sup>^</sup>
Manitoba	7	0.5	49	4.0
WRHA	2	0.3	11	1.5
Southern Health-Santé Sud	3	1.6	15	8.3
Interlake-Eastern	1	0.8	3	2.5
Prairie Mountain	0	0.0	6	3.3
Northern	1	1.3	16	20.9

<sup>^</sup> Cases per 100,000 population

## Zoonotic and Environmental Diseases

For the purposes of this report, zoonotic and environmental diseases are those communicable diseases which are, or are capable of being, transmitted to humans through animals, or from some aspect of the environment. In 2013, 13 zoonotic diseases were reported in the province; they are listed in Table 37.

Table 37: Zoonotic and Environmental Diseases in Manitoba, 2008-2013

Disease Name	2008		2009		2010		2011		2012		2013	
	Number of Cases	Incidence^										
Blastomycosis	17	1.4	9	0.7	6	0.5	9	0.7	14	1.1	19	1.5
Brucellosis*	0	0.0	1	0.1	1	0.1	3	0.2	1	0.1	2	0.2
Dengue^	1	0.1	0	0.0	0	0.0	3	0.2	4	0.3	12	0.9
<i>Diphyllobothrium latum</i> ^	8	0.7	5	0.4	10	0.8	9	0.7	4	0.3	13	1.0
Hantavirus*	0	0.0	0	0.0	0	0.0	0	0.0	1	0.1	0	0.0
Legionellosis*	1	0.1	0	0.0	5	0.4	5	0.4	3	0.2	4	0.3
Lyme	5	0.4	1	0.1	7	0.6	7	0.6	7	0.6	17	1.3
Malaria^	12	1.0	14	1.2	14	1.1	26	2.1	18	1.4	15	1.2
Q Fever*	1	0.1	2	0.2	0	0.0	1	0.1	0	0.0	2	0.2
Rickettsial Disease, Other*	0	0.0	0	0.0	1	0.1	1	0.1	0	0.0	0	0.0
Strongyloidiasis	6	0.5	11	0.9	15	1.2	44	3.5	19	1.5	25	1.9
Toxoplasmosis*	0	0.0	1	0.1	4	0.3	5	0.4	3	0.2	0	0.0
Trichinosis*	0	0.0	0	0.0	2	0.2	0	0.0	2	0.2	0	0.0
Trypanosomiasis*	0	0.0	0	0.0	3	0.2	7	0.6	4	0.3	3	0.2
Tularemia*	1	0.1	1	0.1	1	0.1	1	0.1	0	0.0	4	0.3

^ Cases per 100,000 population

\* Disease with a cell count ≤ 5 in 2013; will not have a detailed analyses performed (see Methods, page 4)

^ Disease of rare occurrence (see Methods, page 4)

## Blastomycosis

Blastomycosis affected twice as many males as it did females, in both 2013 and the 5-year average (Table 38). Table 39 indicates males aged 1 to 4 had the highest incidence in 2013 (5.9 cases per 100,000 population). Figure 30 shows WRHA had the highest incidence rates in both 2013 (1.8 cases per 100,000 population) and the 5-year average (1.3 cases per 100,000 population) but, all RHAs experienced higher incidence rates in 2013 than in the 5-year average.

Table 38: Blastomycosis in Manitoba, 2013 and 5-year Average (2008-2012)

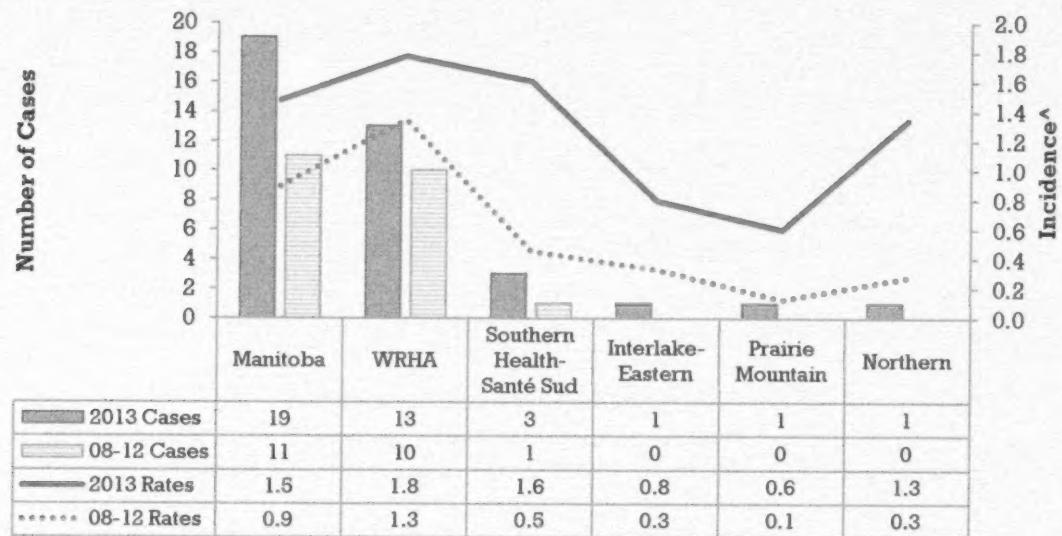
	2013	2008-2012
	Total	5-year Average
Number of Cases		
Overall	19	11
Male	13	8
Female	6	4
Incidence <sup>^</sup>		
Overall	1.5	0.9
Male	2.0	1.2
Female	0.9	0.6
Age at Onset (years)		
Average	34.7	44.1
Median	29.5	40.0
Min. /Max.	(2.8, 74.5)	(6.8, 88.2)

<sup>^</sup> Cases per 100,000 population

Table 39: Blastomycosis by Age Group and Sex in Manitoba, 2013, (n=19)

Age Group	Female		Male	
	Number of Cases	Incidence <sup>^</sup>	Number of Cases	Incidence <sup>^</sup>
<1	0	0.0	0	0.0
1-4	0	0.0	2	5.9
5-9	0	0.0	2	4.9
10-14	0	0.0	0	0.0
15-19	2	4.7	1	2.2
20-24	0	0.0	1	2.1
25-29	1	2.2	1	2.2
30-39	1	1.2	1	1.2
40-59	1	0.6	2	1.1
Over 60	1	0.7	3	2.6

<sup>^</sup> Cases per 100,000 population



<sup>^</sup> Cases per 100,000 population

Figure 30: Blastomycosis by Regional Health Authority in Manitoba, 2013 and 5-year Average (2008-2012)

## Dengue

In 2013, there were twelve confirmed cases of dengue in the province. This categorizes dengue as a disease of rare occurrence (see Methods, page 4). Table 40 shows the incidence of dengue in 2013 was 9 times greater than the incidence in the 5-year average (0.9 cases per 100,000 population compared to 0.1 cases per 100,000 population). WRHA had the highest incidence of the disease in 2013 with 1.2 cases per 100,000 population, accounting for nine of the twelve confirmed cases in the province (Table 42). Note: the laboratory test to confirm dengue checks the specimen for antibodies against the dengue virus. If a person has ever acquired dengue, their body will always produce antibodies against the virus; therefore, the test is not able to differentiate between current and past infections. In Manitoba, dengue is only acquired by travelling to countries in which the disease is prevalent; secondary transmission is not possible within the province.

Table 40: Dengue in Manitoba, 2013 and 5-year Average (2008-2012)

	2013	2008-2012
	Total	5-year Average
Number of Cases		
Overall	12	2
Male	7	2
Female	5	0
Incidence <sup>^</sup>		
Overall	0.9	0.1
Male	1.1	0.3
Female	0.8	0.0
Age at Onset (years)		
Average	33.9	36.1
Median	31.4	33.1
Min. /Max.	(3.9, 69.3)	(33.1, 70.7)

<sup>^</sup> Cases per 100,000 population

Table 41: Dengue by Age Group and Sex in Manitoba, 2013, (n=12)

Age Group	Female		Male	
	Number of Cases	Incidence <sup>^</sup>	Number of Cases	Incidence <sup>^</sup>
<1	0	0.0	0	0.0
1-4	0	0.0	1	3.0
5-9	0	0.0	0	0.0
10-14	1	2.6	0	0.0
15-19	0	0.0	1	2.2
20-24	0	0.0	0	0.0
25-29	2	4.5	1	2.2
30-39	0	0.0	2	2.4
40-59	1	0.6	2	1.1
Over 60	1	0.7	0	0.0

<sup>^</sup> Cases per 100,000 population

Table 42: Dengue by Regional Health Authority in Manitoba, 2013 and 5-year Average (2008-2012)

RHA	2013		2008-2012	
	Total		5-year Average	
	Number of Cases	Incidence^	Number of Cases	Incidence^
Manitoba	12	0.9	2	0.1
WRHA	9	1.2	2	0.2
Southern Health-Santé Sud	1	0.5	<1	0.1
Interlake-Eastern	1	0.8	<1	0.2
Prairie Mountain	1	0.6	0	0.0
Northern	0	0.0	0	0.0

<sup>^</sup> Cases per 100,000 population

### *Diphyllobothrium latum*

*Diphyllobothrium latum* (the fish tape worm) is categorized as a disease of rare occurrence; in 2013, there were thirteen confirmed cases of *Diphyllobothrium latum* in Manitoba (see Methods, page 4). In 2013, the age range of people infected with this parasite spanned about 30 years (Table 43); no one below the age of 22 acquired this type of tape worm. Table 45 shows, eleven of the thirteen confirmed cases occurred in WRHA, but Northern RHA had the highest incidence rate with 2.7 cases per 100,000 population in 2013.

Table 43: *Diphyllobothrium latum* in Manitoba, 2013 and 5-year Average (2008-2012)

	2013	2008-2012
	Total	5-year Average
Number of Cases		
Overall	13	8
Male	6	5
Female	7	3
Incidence <sup>^</sup>		
Overall	1.0	0.6
Male	0.9	0.7
Female	1.1	0.5
Age at Onset (years)		
Average	39.1	41.9
Median	42.3	43.5
Min. /Max.	(22.1, 52.8)	(3.4, 63.1)

<sup>^</sup> Cases per 100,000 population

Table 44: *Diphyllobothrium latum* by Age Group and Sex in Manitoba, 2013, (n=13)

Age Group	Female		Male	
	Number of Cases	Incidence <sup>^</sup>	Number of Cases	Incidence <sup>^</sup>
<1	0	0.0	0	0.0
1-4	0	0.0	0	0.0
5-9	0	0.0	0	0.0
10-14	0	0.0	0	0.0
15-19	0	0.0	0	0.0
20-24	0	0.0	2	4.1
25-29	0	0.0	1	2.2
30-39	2	2.4	1	1.2
40-59	5	2.9	2	1.1
Over 60	0	0.0	0	0.0

<sup>^</sup> Cases per 100,000 population

Table 45: *Diphyllobothrium latum* by Regional Health Authority in Manitoba, 2013 and 5-year Average (2008-2012)

RHA	2013		2008-2012	
	Total		5-year Average	
	Number of Cases	Incidence <sup>^</sup>	Number of Cases	Incidence <sup>^</sup>
Manitoba	13	1.0	8	0.6
WRHA	11	1.5	5	0.6
Southern Health-Santé Sud	0	0.0	2	0.7
Interlake-Eastern	0	0.0	1	0.7
Prairie Mountain	0	0.0	<1	0.1
Northern	2	2.7	1	0.8

<sup>^</sup> Cases per 100,000 population

## Lyme Disease

Table 46 shows the incidence of confirmed Lyme disease in Manitoba, in 2013, was over 3 times greater than the 5-year average incidence (1.3 cases per 100,000 population compared to 0.4 cases per 100,000 population). In 2013, Lyme disease was only acquired by people over the age of 10 (Tables 46 and 47) with the highest rates being for males in the 15-19 year old age group (6.6 cases per 100,000 population).

Table 46: Lyme in Manitoba, 2013 and 5-year Average (2008-2012)

	2013	2008-2012
Total		5-year Average
<b>Number of Cases</b>		
Overall	17	6
Male	10	3
Female	7	3
<b>Incidence<sup>A</sup></b>		
Overall	1.3	0.4
Male	1.6	0.5
Female	1.1	0.4
<b>Age at Onset (years)</b>		
Average	40.3	40.7
Median	38.9	46.0
Min. /Max.	(10.5, 81.4)	(3.9, 69.2)

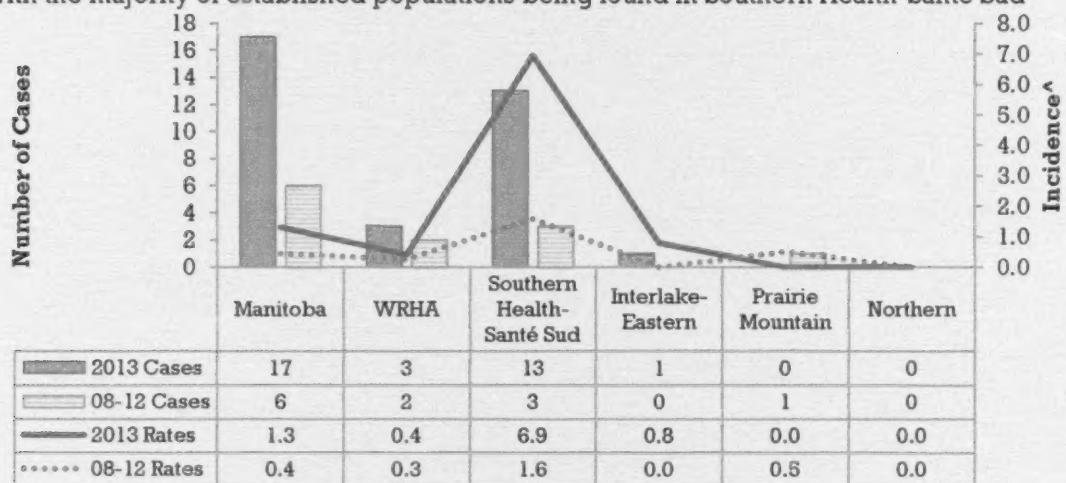
<sup>A</sup> Cases per 100,000 population

Table 47: Lyme by Age Group and Sex in Manitoba, 2013, (n=17)

Age Group	Female		Male	
	Number of Cases	Incidence <sup>A</sup>	Number of Cases	Incidence <sup>A</sup>
<1	0	0.0	0	0.0
1-4	0	0.0	0	0.0
5-9	0	0.0	0	0.0
10-14	0	0.0	2	4.8
15-19	1	2.3	3	6.6
20-24	0	0.0	0	0.0
25-29	0	0.0	0	0.0
30-39	1	1.2	2	2.4
40-59	3	1.7	1	0.6
Over 60	2	1.4	2	1.7

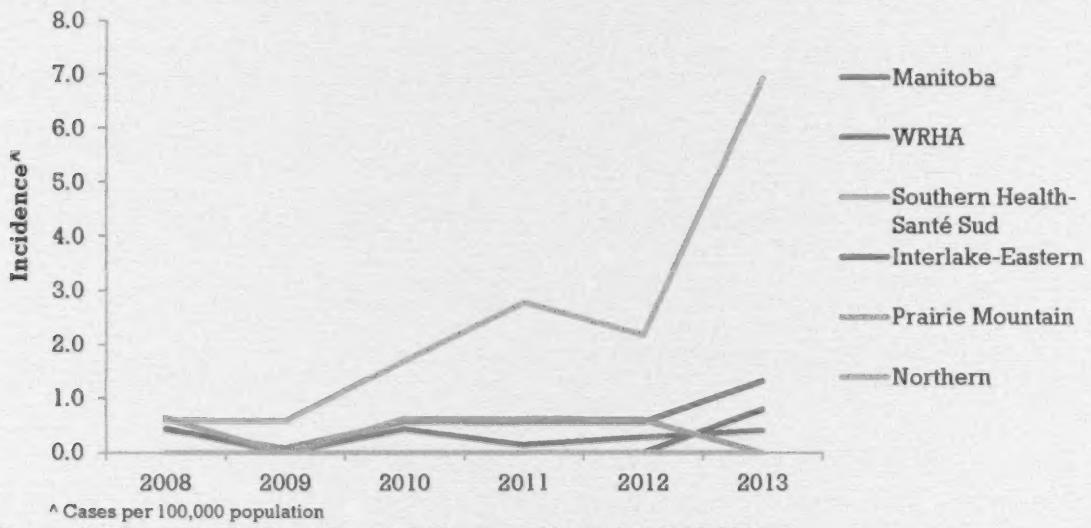
<sup>A</sup> Cases per 100,000 population

Southern Health-Santé Sud had the highest incidence of Lyme disease in both 2013 and in the 5-year average. Their incidence rate in 2013 was four times greater than their 5-year average incidence rate (6.9 cases per 100,000 population compared to 1.6 cases per 100,000 population) (Figure 31). Figure 32 shows Southern Health-Santé Sud carried the largest burden of Lyme disease; its incidence rates increased by about 6 cases per 100,000 population between 2008 and 2013 while the other RHA's incidence rates remained constant. Northern RHA had no cases of Lyme disease within the 6 years from 2008 to 2013. These trends are not surprising as between 1995 and 2013 there were no established black-legged tick populations found in Northern RHA (as of 2013, the most northern black-legged tick population was established in Patricia Beach Provincial Park), with the majority of established populations being found in Southern Health-Santé Sud<sup>3</sup>



<sup>^</sup> Cases per 100,000 population

Figure 31: Lyme by Regional Health Authority in Manitoba, 2013 and 5-year Average (2008-2012)



<sup>^</sup> Cases per 100,000 population

Figure 32: Lyme by Regional Health Authority in Manitoba, 2008-2013

<sup>3</sup> Manitoba Health, Healthy Living and Seniors. Lyme Disease Risk Areas and Blacklegged Tick Surveillance in Manitoba. Accessed: September 24, 2014. <http://www.gov.mb.ca/health/lyme/surveillance.html>.

## Malaria

In 2013, fifteen cases of malaria were confirmed in the province, categorizing malaria as a disease of rare occurrence (see Methods, page 4). Males made up about 9 in 10 (93%) of the confirmed cases in 2013, with an incidence rate eleven times that of females (2.2 cases per 100,000 population compared to 0.2 cases per 100,000 population). The difference between sexes was not as apparent in the 5-year average, but males still had an incidence rate twice that of females (1.8 cases per 100,000 population compared to 0.9 cases per 100,000 population) (Table 48). In 2013, Prairie Mountain Health had the highest incidence of malaria with 1.8 cases per 100,000 population; WRHA had similar rates with 1.5 cases per 100,000 population. The other three RHAs displayed low incidence rates for this disease (Table 50). Malaria is considered a travel acquired disease.

Table 48: Malaria in Manitoba, 2013 and 5-year Average (2008-2012)

	2013	2008-2012
	Total	5-year Average
Number of Cases		
Overall	15	17
Male	14	11
Female	1	6
Incidence <sup>a</sup>		
Overall	1.2	1.4
Male	2.2	1.8
Female	0.2	0.9
Age at Onset (years)		
Average	27.8	31.3
Median	26.5	29.1
Min. /Max.	(2.1, 58.9)	(0.0, 90.3)

<sup>a</sup> Cases per 100,000 population

Table 49: Malaria by Age Group and Sex in Manitoba, 2013, (n=15)

Age Group	Female		Male	
	Number of Cases	Incidence <sup>a</sup>	Number of Cases	Incidence <sup>a</sup>
<1	0	0.0	0	0.0
1-4	0	0.0	2	5.9
5-9	0	0.0	1	2.4
10-14	0	0.0	0	0.0
15-19	1	2.3	1	2.2
20-24	0	0.0	2	4.1
25-29	0	0.0	1	2.2
30-39	0	0.0	4	4.8
40-59	0	0.0	3	1.7
Over 60	0	0.0	0	0.0

<sup>a</sup> Cases per 100,000 population

Table 50: Malaria by Regional Health Authority in Manitoba, 2013 and 5-year Average (2008-2012)

RHA	2013		2008-2012	
	Total		5-year Average	
	Number of Cases	Incidence^	Number of Cases	Incidence^
Manitoba	15	1.2	17	1.4
WRHA	11	1.5	14	2.0
Southern Health-Santé Sud	0	0.0	1	0.5
Interlake-Eastern	1	0.8	<1	0.2
Prairie Mountain	3	1.8	2	0.9
Northern	0	0.0	1	0.8

<sup>^</sup> Cases per 100,000 population

## Strongyloidiasis

The incidence rate of strongyloidiasis was essentially unchanged in 2013 when compared to the 5-year average; there was an increase of 0.4 cases per 100,000 population (Table 51). From Figure 33, it appears no particular age group was primarily affected by the disease. In 2013, the highest incidence of strongyloidiasis occurred in females ages 10 to 14 (5.2 cases per 100,000 population), while several age groups had an incidence of 0 cases per 100,000 population.

Table 51: Strongyloidiasis in Manitoba, 2013 and 5-year Average (2008-2012)

	2013	2008-2012
	Total	5-year Average
<b>Number of Cases</b>		
Overall	25	19
Male	15	13
Female	10	7
<b>Incidence<sup>^</sup></b>		
Overall	1.9	1.5
Male	2.3	2.0
Female	1.5	1.1
<b>Age at Onset (years)</b>		
Average	32.9	33.4
Median	30.9	33.4
Min. /Max.	(2.2, 90.4)	(1.2, 80.5)

<sup>^</sup> Cases per 100,000 population

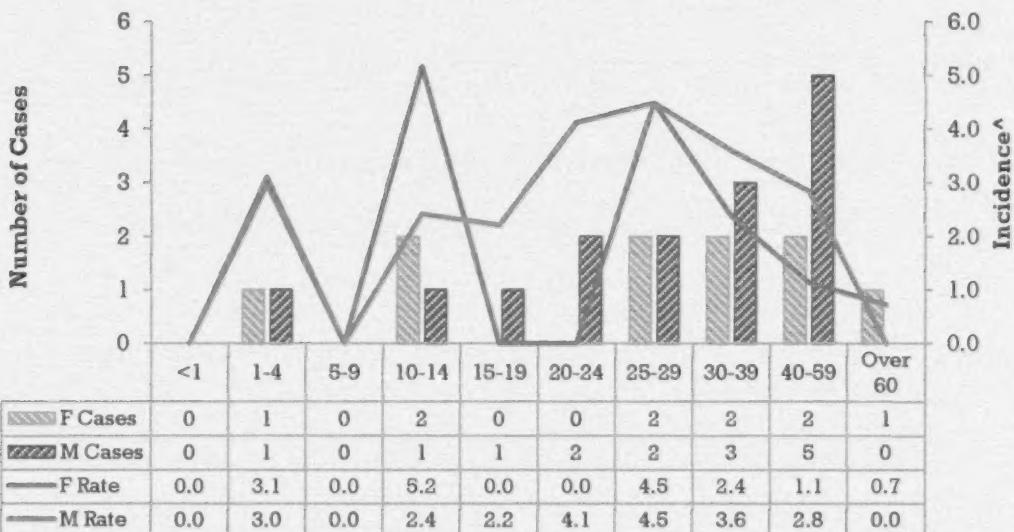
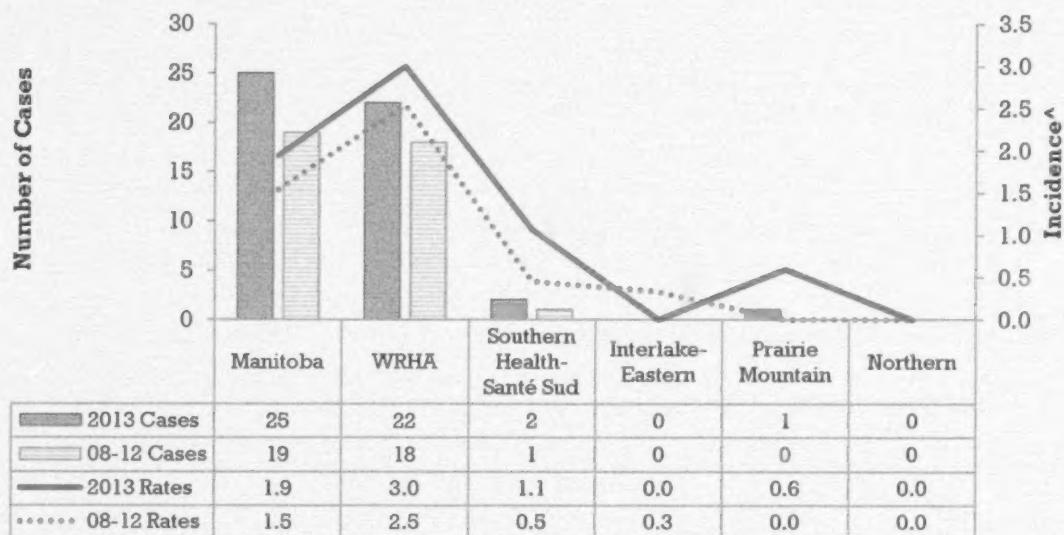


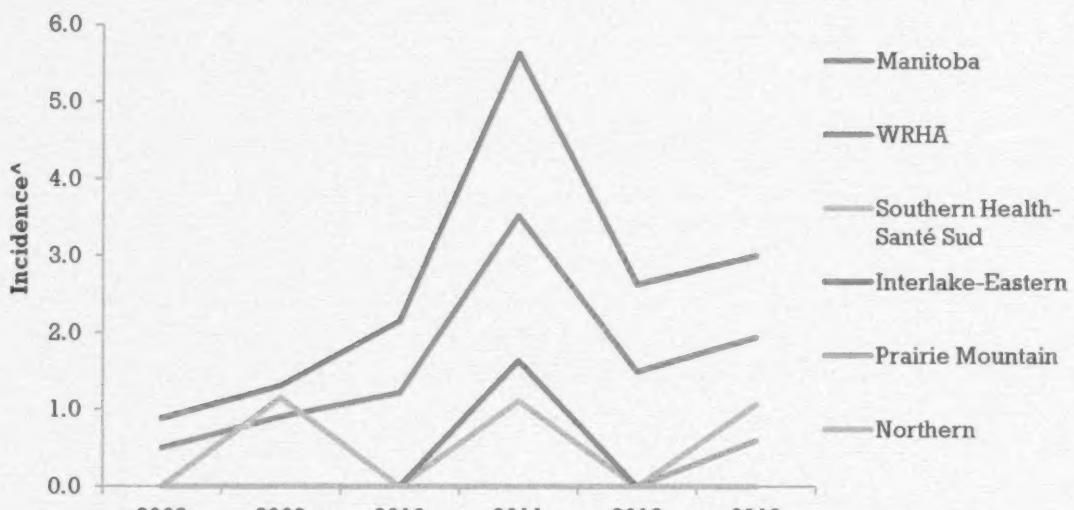
Figure 33: Strongyloidiasis by Age Group and Sex in Manitoba, 2013, (n=25)

Figure 34 shows WRHA had the highest incidence of strongyloidiasis in 2013 with 3.0 cases per 100,000 population. In fact, they had the highest incidence rates over all six years from 2008 to 2013 (Figure 35). Over these six years, there were no cases of the disease in Northern RHA. An interesting peak in incidence rates was seen for most of the RHAs in 2011.



<sup>a</sup> Cases per 100,000 population

Figure 34: Strongyloidiasis by Regional Health Authority in Manitoba, 2013 and 5-year Average (2008-2012)



<sup>a</sup> Cases per 100,000 population

Figure 35: Strongyloidiasis by Regional Health Authority in Manitoba, 2008-2013

## Other Diseases

For the purposes of this report, the term “other diseases” is used for those diseases not easily captured in other broad groupings. In 2013, there were seven diseases classified as other in Manitoba.

Table 52: Other Diseases in Manitoba, 2008-2013

Disease Name	2008		2009		2010		2011		2012		2013	
	Number of Cases	Incidence^										
Creutzfeldt-Jakob Disease (CJD)*	0	0.0	3	0.2	0	0.0	1	0.08	0	0.0	1	0.1
Invasive Beta-hemolytic Streptococcal Disease	183	15.3	251	20.7	225	18.3	272	21.75	304	23.9	313	24.3
Necrotizing Fasciitis	16	1.3	3	0.2	12	1.0	3	0.24	3	0.2	19	1.5
<i>Staphylococcus aureus</i> (Toxic Shock)*	2	0.2	0	0.0	0	0.0	0	0.00	0	0.0	0	0.0
Streptococcal Glomerulonephritis*	0	0.0	0	0.0	0	0.0	0	0.00	1	0.1	0	0.0
Streptococcal Toxic Shock Syndrome (STSS)*	1	0.1	2	0.2	0	0.0	1	0.08	0	0.0	4	0.3
Viral Hepatitis, Other*	0	0.0	0	0.0	6	0.5	0	0.00	2	0.2	3	0.2

<sup>^</sup> Cases per 100,000 population

\* Disease with a cell count ≤ 5 in 2013; will not have a detailed analyses performed (see Methods, page 4)

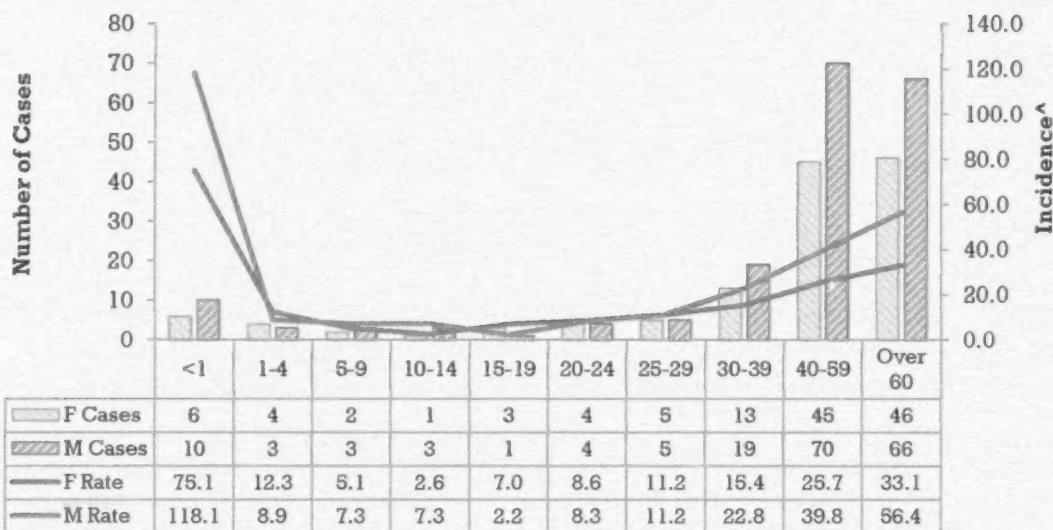
## Invasive Beta-hemolytic Streptococcal Disease

This category includes *all* beta-hemolytic streptococcal species isolated from normally sterile sites. Infants (<1 year) and adults over the age of 60 had the highest incidence of invasive beta-hemolytic streptococcal disease in 2013 (Figure 36). Infants experienced 97.2 cases per 100,000 population; adults over 60 experienced 43.7 cases per 100,000 population.

Table 53: Invasive Beta-hemolytic Streptococcal Disease in Manitoba, 2013 and 5-year Average (2008-2012)

	2013	2008-2012
	Total	5-year Average
<b>Number of Cases</b>		
Overall	313	247
Male	184	134
Female	129	113
<b>Incidence<sup>^</sup></b>		
Overall	24.3	20.0
Male	28.8	22.0
Female	19.8	18.1
<b>Age at Onset (years)</b>		
Average	50.8	50.3
Median	53.9	54.2
Min. /Max.	(0.0, 96.1)	(<1, 99.4)

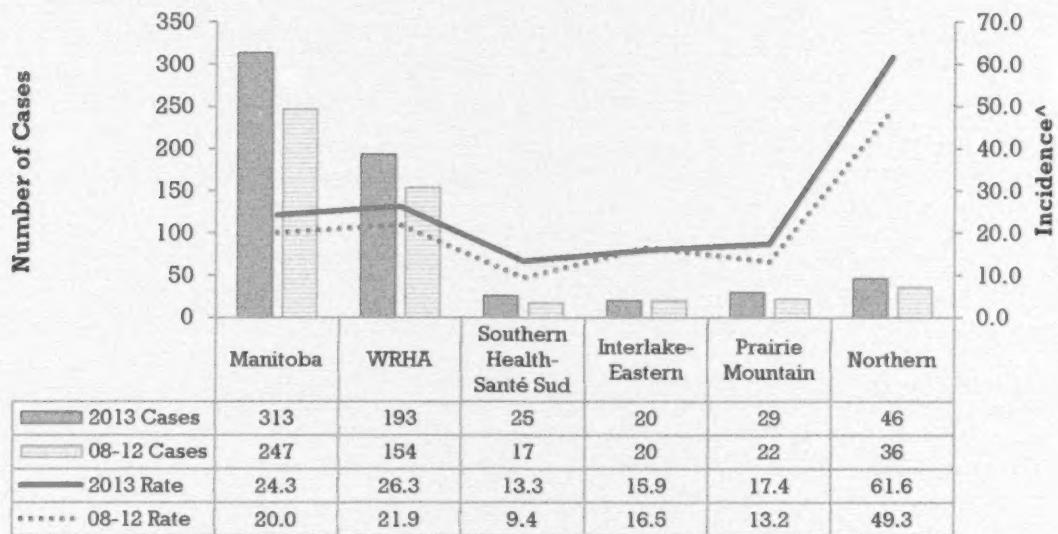
<sup>^</sup> Cases per 100,000 population



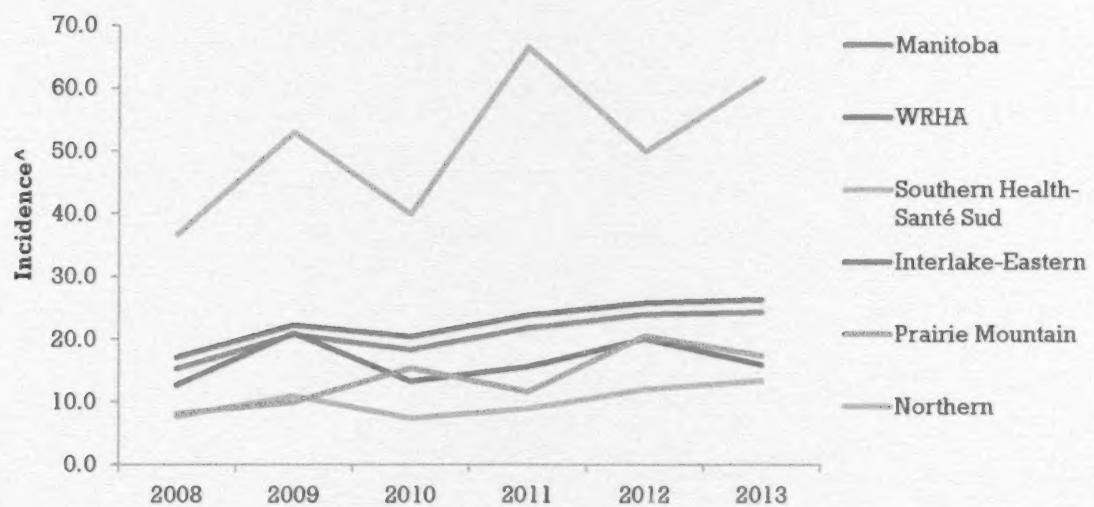
<sup>^</sup> Cases per 100,000 population

Figure 36: Invasive Beta-hemolytic Streptococcal Disease by Age Group and Sex in Manitoba, 2013, (n=313)

Figures 37 and 38 indicate Northern RHA had the highest incidence of invasive beta-hemolytic streptococcal disease of all the RHAs, from 2008 to 2013, with a rate of 61.6 cases per 100,000 population in 2013. WRHA had the second highest rate over all years from 2008 to 2013 with 26.3 cases per 100,000 population in 2013. The other three RHAs had similar rates over the six years, ranging between 13.3 and 17.4 cases per 100,000 population in 2013.



<sup>^</sup> Cases per 100,000 population  
Figure 37: Invasive Beta-hemolytic Streptococcal Disease by Regional Health Authority in Manitoba, 2013 and 5-year Average (2008-2012)



<sup>^</sup> Cases per 100,000 population  
Figure 38: Invasive Beta-hemolytic Streptococcal Disease by Regional Health Authority in Manitoba, 2008-2013

## Streptococcal Necrotizing Fasciitis

In Manitoba, confirmed cases of streptococcal necrotizing fasciitis, also known as "flesh eating disease", occurred only in individuals above the age of 28, in 2013 (Table 54). This trend is not apparent in the 5-year average where the minimum age diagnosed with strep. necrotizing fasciitis was 4.8 years. The 2013 incidence was over twice that of the 5-year average incidence (1.5 cases per 100,000 population compared to 0.6 cases per 100,000 population).

Table 54: Streptococcal Necrotizing Fasciitis in Manitoba, 2013 and 5-year Average (2008-2012)

	2013	2008-2012
	Total	5-year Average
Number of Cases		
Overall	19	8
Male	11	4
Female	8	5
Incidence <sup>A</sup>		
Overall	1.5	0.6
Male	1.7	0.5
Female	1.2	0.7
Age at Onset (years)		
Average	47.4	45.7
Median	48.6	47.4
Min./Max.	(28.4, 82.3)	(4.8, 90.2)

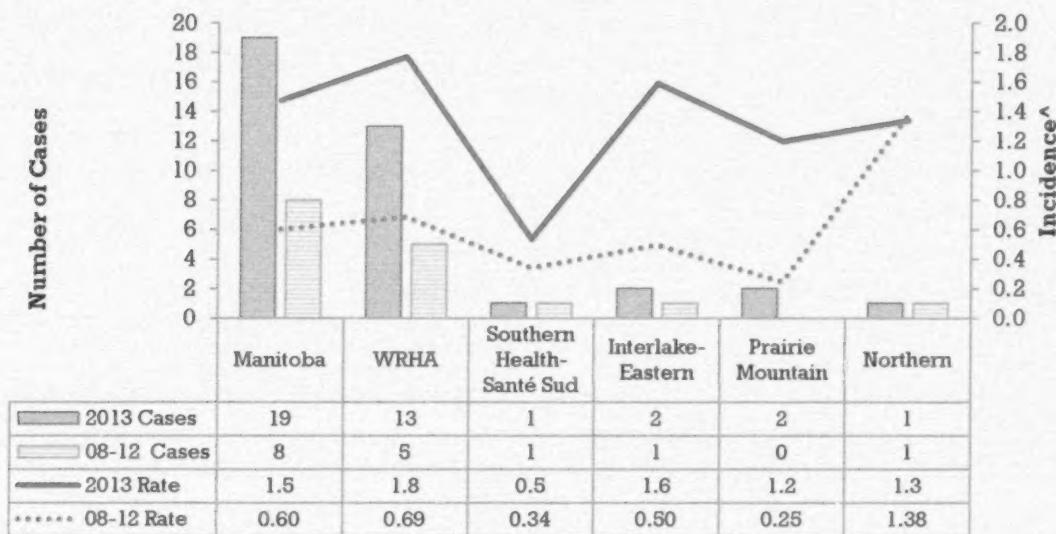
<sup>A</sup>Cases per 100,000 population

Table 55: Streptococcal Necrotizing Fasciitis by Age Group and Sex in Manitoba, 2013, (n=19)

Age Group	Female		Male	
	Number of Cases	Incidence <sup>A</sup>	Number of Cases	Incidence <sup>A</sup>
<1	0	0.0	0	0.0
1-4	0	0.0	0	0.0
5-9	0	0.0	0	0.0
10-14	0	0.0	0	0.0
15-19	0	0.0	0	0.0
20-24	0	0.0	0	0.0
25-29	0	0.0	1	2.2
30-39	4	4.7	1	1.2
40-59	4	2.3	7	4.0
Over 60	0	0.0	2	1.7

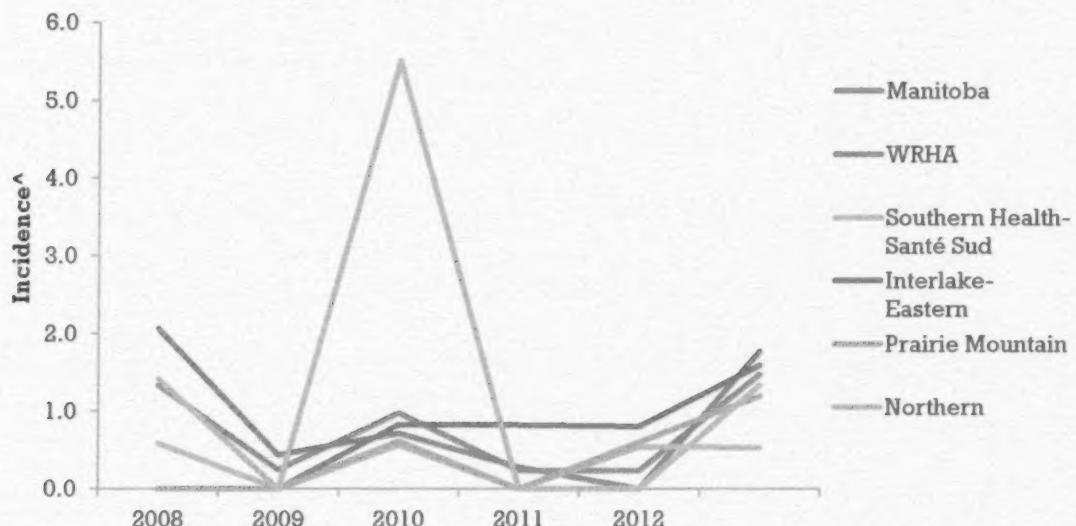
<sup>A</sup>Cases per 100,000 population

Four of the five RHAs had very similar rates for strep. necrotizing fasciitis, ranging between 1.2 cases per 100,000 population in Prairie Mountain Health and 1.8 cases per 100,000 population in WRHA. The RHA with the lowest incidence rate was Southern Health – Santé Sud with 0.5 cases per 100,000 population (Figure 39). Figure 40 shows the RHAs had similar incidence rates between 2008 and 2013 with the exception of Northern RHA. Northern RHA experienced a sudden peak in incidence in 2010 - rates went from approximately 0.0 cases per 100,000 population to between 5.0 and 6.0 cases per 100,000 population.



<sup>a</sup>Cases per 100,000 population

Figure 39: Streptococcal Necrotizing Fasciitis by Regional Health Authority in Manitoba, 2013 and 5-year Average (2008-2012)



<sup>a</sup>Cases per 100,000 population

Figure 40: Streptococcal Necrotizing Fasciitis by Regional Health Authority in Manitoba, 2008-2013

## Appendix A – Reportable diseases under the Public Health Act of Manitoba

The following diseases and/or conditions are (human) reportable diseases, as prescribed by *The Reporting of Diseases and Conditions Regulation<sup>4</sup>* under *The Public Health Act*.

Common name	Scientific or technical name of disease or its infectious agent
* AIDS	Acquired Immunodeficiency Syndrome
Amoebiasis	<i>Entamoeba histolytica</i>
* + Anthrax	<i>Bacillus anthracis</i>
* + Avian Influenza	Influenza A virus, select Hemagglutinin and Neuraminidase types
Blastomycosis	<i>Blastomyces dermatitidis</i>
* + Botulism	<i>Clostridium botulinum</i>
Brucellosis	<i>Brucella</i> species
Campylobacter	<i>Campylobacter</i> species
Cancer or malignant neoplasm	Cancer or malignant neoplasm
Chancroid	<i>Haemophilus ducreyi</i>
Chlamydia	<i>Chlamydia trachomatis</i>
+ Cholera	<i>Vibrio cholerae</i> , typable
<i>Clostridium difficile</i> toxin	<i>Clostridium difficile</i>
<i>Clostridium perfringens</i> (except wound specimens)	<i>Clostridium perfringens</i>
* Congenital Rubella Infection/Syndrome	Rubella virus
Cryptosporidium	<i>Cryptosporidium parvum</i>
Cyclospora	<i>Cyclospora cayetanensis</i>
* Creutzfeldt-Jakob Disease	Creutzfeldt-Jakob disease prion
Dengue Fever	Dengue virus
* + Diphtheria (Cases and Carriers)	Toxigenic <i>Corynebacterium diphtheriae</i> (all subspecies)
* Encephalitis	Encephalitis
Fish Tapeworm	<i>Diphyllobothrium latum</i> ( <i>Dibothrioccephalus latus</i> )

<sup>4</sup> Manitoba Health, Healthy Living and Seniors. (2009). *Reporting of Diseases and Conditions Regulation*. Available at: [http://web2.gov.mb.ca/lawsregs/current/\\_pdf-regs.php?reg=37/2009](http://web2.gov.mb.ca/lawsregs/current/_pdf-regs.php?reg=37/2009). Accessed: September 24, 2014

Common name	Scientific or technical name of disease or its infectious agent
Food poisoning caused by <i>Bacillus cereus</i>	<i>Bacillus cereus</i>
Giardia	<i>Giardia lamblia</i>
Gonorrhea	<i>Neisseria gonorrhoeae</i>
Hantavirus	Hantavirus
*Haemophilus invasive disease from type-able Haemophilus organisms	<i>Haemophilus influenzae</i>
* + Hemolytic Uremic Syndrome (HUS)	Hemolytic Uremic Syndrome
Hepatitis A	Hepatitis A virus
Hepatitis B	Hepatitis B virus
Hepatitis C	Hepatitis C virus
Hepatitis, Viral (Other)	Hepatitis viruses other than A, B or C
HIV	Human immunodeficiency virus
Influenza A	Influenza A viruses
Influenza B	Influenza B viruses
Legionellosis	<i>Legionella pneumophila</i>
* Leprosy	<i>Mycobacterium leprae</i>
* LGV	<i>Lymphogranuloma venereum (Chlamydia trachomatis)</i>
Listeriosis invasive disease	<i>Listeria monocytogenes</i> in normally sterile tissue
* Lyme Disease	<i>Borrelia burgdorferi</i>
Malaria	<i>Plasmodium falciparum</i> <i>Plasmodium vivax</i> <i>Plasmodium malariae</i> <i>Plasmodium ovale</i>
* + Measles	Rubeola virus
* + Meningococcal invasive disease	<i>Neisseria meningitidis</i>
Methicillin Resistant <i>Staphylococcus aureus</i> (MRSA)	<i>Staphylococcus aureus</i> with Methicillin resistance
* Mumps	Mumps virus

Common name	Scientific or technical name of disease or its infectious agent
Parapertussis	<i>Bordetella parapertussis</i>
Parasitic Diseases other than amoebiasis, cryptosporidium, cyclospora, fish tapeworm, giardia, malaria, strongyloidiasis, toxoplasmosis, trichinosis and trypanosomiasis	
Parrot Fever (Psittacosis)	<i>Chlamydophila psittaci</i>
Penicillin resistant pneumococci	<i>Streptococcus pneumoniae</i> with penicillin resistance
* Pertussis	<i>Bordetella pertussis</i>
Plague	<i>Yersinia pestis</i>
Pneumococcal invasive disease (any normally sterile body site)	<i>Streptococcus pneumoniae</i>
* + Polio	Poliovirus
Q fever	<i>Coxiella burnetii</i>
* + Rabies	Rabies virus
Relapsing Fever	<i>Borrelia recurrentis</i> <i>Borrelia duttoni</i>
Rickettsial Diseases other than Rocky Mountain Spotted Fever, Q-fever and typhus	
Rocky Mountain Spotted Fever	<i>Rickettsia rickettsii</i>
* Rubella	Rubella virus
Salmonella	<i>Salmonella</i> species
* + Severe Acute Respiratory Syndrome (SARS)	SARS coronavirus
* + Severe Respiratory Illness (SRI)	Severe Respiratory Illness
Shigella	<i>Shigella</i> species
* + Smallpox	<i>Variola major</i> virus <i>Variola minor</i> virus
Staphylococcal Food Poisoning	<i>Staphylococcus aureus</i>
* Staphylococcal Toxic Shock Syndrome	<i>Staphylococcus aureus</i> in blood or normally sterile tissue in association with Toxic Shock Syndrome

Common name	Scientific or technical name of disease or its infectious agent
Beta Hemolytic Streptococcal invasive disease, typable	<i>Beta Hemolytic Streptococcal</i> typable species in blood or normally sterile tissue. (Includes all samples of <i>Strep.</i> Group A, B, C, D, E, F or G found in blood, sterile tissue or internal aspirates — not in skin or wounds.)
* Streptococcal Necrotizing Fasciitis	<i>Streptococcus</i> species in blood or normally sterile tissue in association with Necrotizing Fasciitis. (Includes all samples of <i>Strep.</i> Group A, B, C, D, E, F or G found in tissue or wounds that are accompanied by a clinical assessment of NF.)
* Streptococcal Necrotizing Myositis	<i>Streptococcus</i> species in blood or normally sterile tissue in association with Necrotizing Myositis. (Includes all samples of <i>Strep.</i> Group A, B, C, D, E, F or G found in tissue or wounds that are accompanied by a clinical assessment of NM.)
* Streptococcal Toxic Shock Syndrome	<i>Streptococcus</i> species in blood or normally sterile tissue in association with Toxic Shock Syndrome. (Includes all samples of <i>Strep.</i> Group A, B, C, D, E, F or G found in blood that are accompanied by a clinical assessment of TSS.)
Strongyloidiasis	<i>Strongyloides stercoralis</i>
Syphilis	<i>Treponema pallidum pallidum</i>
* Tetanus	<i>Clostridium tetani</i>
Toxoplasmosis	<i>Toxoplasma gondii</i>
Trichinosis	<i>Trichinella spiralis</i>
Trypanosomiasis	<i>Trypanosoma</i> species
* Tuberculosis — respiratory	<i>Mycobacterium tuberculosis</i> <i>Mycobacterium africanum</i> <i>Mycobacterium canetti</i> <i>Mycobacterium bovis</i>
Tuberculosis — other	<i>Mycobacterium</i> species (non-tuberculosis)
Tularemia	<i>Francisella tularensis</i>
Typhoid Fever	<i>Salmonella typhi</i>
Typhus	<i>Rickettsia</i> species
Vancomycin Resistant Enterococci (VRE)	<i>Enterococcus</i> species with vancomycin resistance

Common name	Scientific or technical name of disease or its infectious agent
Vancomycin Resistant <i>Staphylococcus aureus</i> (VRSA)	<i>Staphylococcus aureus</i> with vancomycin resistance
Verotoxin-producing organisms	Verotoxin-producing organisms
<i>Vibrio parahaemolyticus</i>	<i>Vibrio parahaemolyticus</i>
* + Viral Hemorrhagic Fever	Viral Hemorrhagic Fever
West Nile Virus (WNV)	West Nile virus
Western Equine Encephalitis	Western Equine Encephalitis virus
*Yellow Fever	Yellow fever virus
Yersinia infections	<i>Yersinia pseudotuberculosis</i> <i>Yersinia enterocolitica</i>

\* A health professional must make a report respecting the reportable disease if the health professional becomes aware that a person (i) has or may have the reportable disease, or (ii) recently had or may have had the reportable disease (clause 3(a) of the Reporting of Diseases and Conditions Regulation).

+ The person in charge of the laboratory must make a report of a reportable disease, to the chief public health officer no later than the day, not including a Saturday or a holiday, after the day that the positive result was isolated and confirmed. In addition, the person in charge of the laboratory must also, within the same period, report the existence of the positive result by telephone to the chief public health officer (clause 9(2)(a) of the Reporting of Diseases and Conditions Regulation).

**Appendix B – Diseases in report, ranked by proportion of cases in Manitoba, 2013**

Disease Name	Number of Cases	Incidence <sup>A</sup>	Percentage
Methicillin-Resistant <i>Staphylococcus aureus</i> (MRSA)	4405	341.7	55.5%
Vancomycin Resistant <i>Enterococci</i> (VRE)	1389	107.7	17.5%
<i>Clostridium difficile</i> Infection	856	66.4	10.8%
Invasive Beta-hemolytic Streptococcal Disease	313	24.3	3.9%
Salmonellosis	227	17.6	2.9%
Campylobacteriosis	210	16.3	2.6%
Invasive Pneumococcal Disease (IPD)	132	10.2	1.7%
Giardiasis	90	7	1.1%
Cryptosporidiosis	40	3.1	0.5%
Verotoxigenic <i>Escherichia coli</i> (VTEC)	29	2.2	0.4%
Strongyloidiasis	25	1.9	0.3%
Shigellosis	23	1.8	0.3%
Blastomycosis	19	1.5	0.2%
Necrotizing Fasciitis	19	1.5	0.2%
Amebiasis	17	1.3	0.2%
Lyme	17	1.3	0.2%
Malaria <sup>R</sup>	15	1.2	0.2%
<i>Haemophilus influenzae</i> <sup>R</sup>	14	1.1	0.2%
<i>Diphyllobothrium latum</i> <sup>R</sup>	13	1	0.2%
Dengue <sup>R</sup>	12	0.9	0.2%
Hepatitis A <sup>R</sup>	11	0.9	0.1%
Invasive Meningococcal Disease (IMD) <sup>R</sup>	9	0.7	0.1%
<i>Clostridium perfringens</i> <sup>R</sup>	7	0.5	0.1%
Paratyphoid <sup>R</sup>	7	0.5	0.1%
Pertussis <sup>R</sup>	7	0.5	0.1%
Yersiniosis*	5	0.4	0.1%
Legionellosis*	4	0.3	0.1%
Tularemia*	4	0.3	0.1%
Streptococcal Toxic Shock Syndrome (STSS)*	4	0.3	0.1%
Trypanosomiasis*	3	0.2	0.0%
Viral Hepatitis, Other*	3	0.2	0.0%
Cyclosporiasis*	2	0.2	0.0%
Listeriosis*	2	0.2	0.0%
<i>Vibrio Parahaemolyticus</i> *	2	0.2	0.0%
Typhoid*	2	0.2	0.0%
Brucellosis*	2	0.2	0.0%
Q. Fever*	2	0.2	0.0%
<i>Bacillus cereus</i> Food Poisoning*	1	0.1	0.0%
Mumps*	1	0.1	0.0%
Creutzfeldt-Jakob Disease (CJD)*	1	0.1	0.0%
Cholera*	0	0	0.0%
Diphtheria*	0	0	0.0%
Measles*	0	0	0.0%
Rubella, Congenital*	0	0	0.0%
Rubella, Confirmed*	0	0	0.0%
Hantavirus*	0	0	0.0%
Rickettsial Disease, Other*	0	0	0.0%
Toxoplasmosis*	0	0	0.0%
Trichinosis*	0	0	0.0%
<i>Staphylococcus aureus</i> (Toxic Shock)*	0	0	0.0%
Streptococcal Glomerulonephritis*	0	0	0.0%
<b>Total</b>	<b>7944</b>		<b>100%</b>

\* Cases per 100,000 population